America's Premier
GUNMAKERS

K D Kirkland

America's Premier GUNMAKERS

K D Kirkland

America's great gunmakers are more than mere industrial entities. They are centers of exacting craftsmanship and precision engineering, and they are truly living legends. American gunmakers built not only the guns which won the Wild West but the guns that won both World Wars, and which today delight demanding sportsmen the world over.

Jonathan Browning, destined to be the founder of Browning Arms was born in 1805 at Brushy Fork, Tennessee, and built his first gun at the tender age of 13, while he was apprenticed to a local blacksmith.

During the twentieth century his name became synonymous with a spectrum of firearms ranging from some of the finest presentation shotguns in the world to most of the aircraft cannon used in the American aircraft during World War II.

Samuel Colt's whittled prototype of the modern revolver, patented in 1836, has become part of the American tradition, as have the company's later models: the Peacemaker ('the gun that won the West'), the Colt Army and Navy Pistols, and today's ubiquitous M16 military rifle.

The history of the firm is in many ways the history of America itself; the artistry and excellence of the guns it manufactured saw the country through the winning of the Wild West and the law enforcement needs brought about by the gangland violence of the Prohibition era, and Colt contributed invaluably to the war effort during World Wars I and II.

Oliver Winchester was born in Boston in 1810. His impoverished youth was followed by an apprenticeship with a carpenter. By age 21, he became a master builder. Winchester first invested his talent and money in the gun business in 1855, when he became one of the original stockholders of the Volcanic Repeating Arms Company.

Winchester never failed to publicize the fact that its guns were the first choice of such star performers as Buffalo Bill Cody.

(continued on back flap)

America's Premier
GUNMAKERS

10
4
BROWNING ARMS COMPANY MORGAN, UTAH & MONTREAL P.Q.
ONE OF FIVE THOUSAND

America's Premier GUNMAKERS

K D Kirkland

MALLARD
PRESS

Copyright © 1990 by Brompton Books Corporation

First published in the United States of America in 1990 by The Mallard Press
Mallard Press and its accompanying design and logo are trademarks of BDD Promotional Book Company, Inc.

All rights reserved

ISBN 0-792-45276-3

Printed in Hong Kong

Designed by Ruth DeJauregui
Edited and captioned by Timothy Jacobs and Marie Cahill

Page 1: This Model 1100 Field Grade shotgun is a fine example of Remington gunmaking skill. *Pages 2—3, from top to bottom:* A .36 caliber Colt Navy revolver of the Civil War era; a super-high quality 'One of Five Thousand' Browning automatic pistol; a classic Model 94 Winchester lever action, in .357 caliber; and a Remington Model 700 Mountain Rifle, in .280 caliber. *These pages, left to right:* The prolific John Moses Browning, founder of Browning Arms; Samuel Colt, inventor and founder of Colt Firearms; Eliphalet Remington II, inventor and founder of Remington Arms; and Oliver F Winchester, founder of Winchester Repeating Arms Company.

Acknowledgements

The author wishes to thank Paul Thompson of Browning NA, Nola Clavio and George K Bukovsky of Remington Arms/El du Pont de Nemours & Co, Inc, Mark A Sweetland of Rumrill-Hoyt, Inc and Janice Murphy at US Repeating Arms for their gracious and invaluable assistance. The author and publisher wish to thank Bruce Kaye at Theodore Roosevelt National Park, Elizabeth Holmes at Buffalo Bill Historical Center, Oster Loh at Olin Corporation, Wayne Boyer and Dennis Clark of Trader's Den in Logan, Utah. The author and publisher would also like to acknowledge the books *John M Browning, American Gunmaker*, by John Browning and Curt Gentry, and *Remington Arms, An American History*, by Alden Hatch, published in 1956 by Rinehart & Company, Inc, from which much of our historical information has been adapted. Finally, special thanks go to Sylvia Kirkland for her assistance in preparing the manuscript.

Photo Credits

All Browning photos courtesy of Browning NA; Colt photos courtesy of Colt Industries; Remington photos courtesy of El du Pont de Nemours & Co, Inc; and all Winchester photos courtesy of Buffalo Bill Historical Center, Cody, Wyoming except the following:

American Graphic Systems Archives 11, 45, 47, 101 (all), 140 (bottom), 114, 331 (bottom), 368 (all), 399
Mike Badrocke 74-75, 78-79
Barker Texas History Center, Prints and Photographs Collection, University of Texas, Austin 134 (middle)
John Batchelor 120-121 (all), 122-123, 134-135 (top), 142-143, 154-155, 162-163, 166-167, 170-171, 174-175, 178-179, 182-183, 190-191, 198-199, 206-207, 214-215
Brompton Books Archives 262, 424-425
The Church of Jesus Christ of Latter Day Saints, Visual Resources Library 36 (bottom)
Cinema Shop 160 (right), 163 (top), 200-201, 204-205, 212 (bottom), 233, 254 (bottom), 301, 308-309, 383, 392, 394-395, 416 (bottom right)
© RE DeJauregui 240, 286-287, 320-321
Denver Public Library, Western History Division 398-399
Dover 133, 137 (middle)
El du Pont de Nemours & Co, Inc via Rumrill-Hoyt 220-221 (all), 222-223, 226-227, 246-247, 302-303, 306-307
Robert Hunt Picture Library 261 (bottom)
Ian V Hogg 50, 51, 76 (top), 178 (bottom)
Lloyd G Ingles, California Academy of Sciences 409 (center)
J&J Kidd 46-47, 54-55, 86-87, 330-331, 335, 338-339, 350-351 (all), 354-355 (all), 358-359, 362-363, 404-405 (all)
© KD Kirkland 86 (bottom), 100, 112 (all), 113, 226 (bottom), 298-299, 303 (bottom), 304-305, 432
Library of Congress 131 (bottom)
Lowie Museum of Anthropology, University of California, Berkeley 393
The National Archives 128 (top), 160 (left), 249 (all), 257
Olin Industries, Incorporated 327, 331 (center), 333, 336, 337, 339, 357, 365 (center), 366, 367, 369 (all), 372 (top), 373, 376, 379, 380, 381, 382, 384, 385, 386, 387, 389, 390, 391(bottom), 392 (right), 397 (bottom), 402, 403, 406 (bottom), 407, 410, 416 (top, bottom left), 418, 419
Peter Newark's Western Americana 178 (middle), 251 (bottom), 259, 276, 423 (top)
Royal Artillary Institution, Museum of Artillary at the Rotunda, London
  Joseph Coughlan 198 (bottom), 251 (center), 426 (bottom)
Seaver Center for Western History Research, Los Angeles County Museum 138-139 (both), 142 (bottom), 146-147, 163 (bottom), 250-251, 256-257, 254-255 (top)
Smithsonian Institution 284 (top)
  National Anthropological Archives 128 (bottom)
South Dakota State Historical Society 254-255 (bottom)
Theodore Roosevelt National Park Visitor Center, Medora, North Dakota 364 (all), 365 (top, bottom)
Mike Trim 78 (bottom right)
US Air Force 74 (top), 75 (right) 76-77, 78 (bottom left), 79 (top), 186, 241, 361
US Army 53, 180 (top), 189 (both), 263, 422
  John Pinderhughes 427 (bottom left)
US Department of Defense 181, 190-191 (bottom)
US Navy 258, 397 (top)
US Repeating Arms Company 348, 359 (bottom), 360-361 (second from bottom), 401 (all), 406 (top), 408-409 (all), 410-411(bottom) 412-413 (top, bottom), 413 (all), 414-415 (all), 417
© Bill Yenne 311, 420

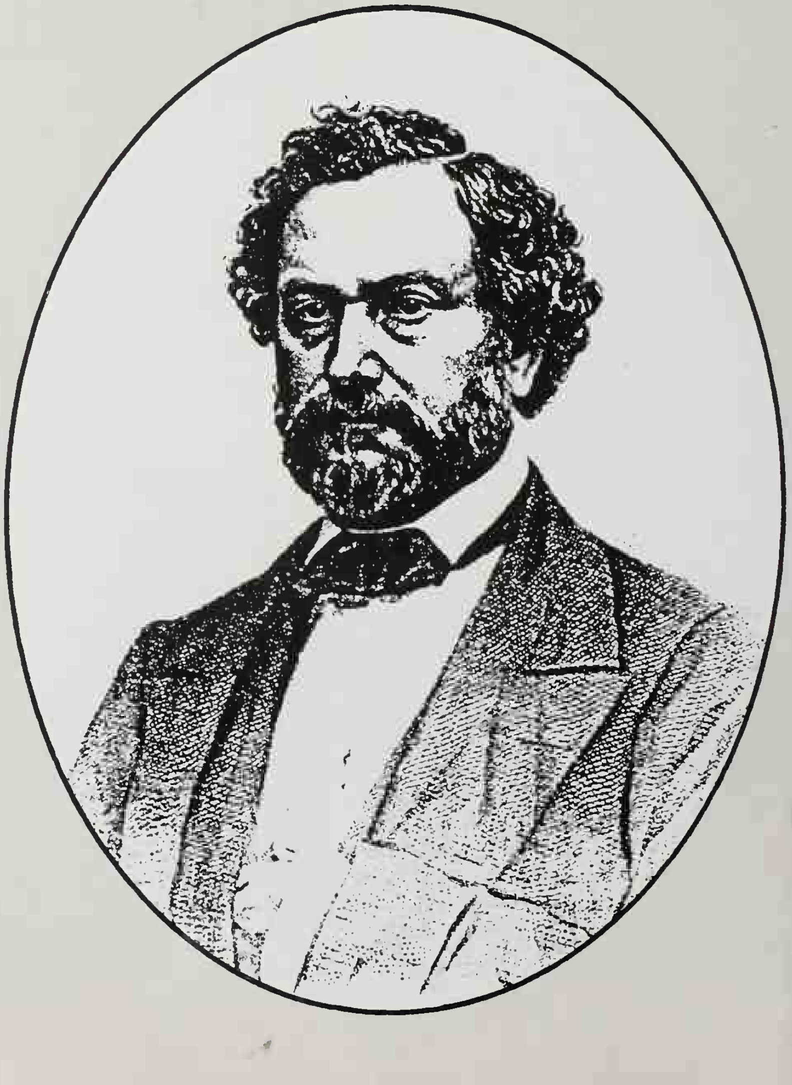


Table of Contents

Browning 6
Jonathan Browning and His Guns 10
John Moses Browning 14
John M Browning's Pistols and Rifles 24
John M Browning's Shotguns 54
Browning's Machine Guns and Aircraft Cannon 66
Fabrique Nationale 82
Newer Browning Pistols and Rifles 86
Newer Browning Shotguns and Bows 94
Browning Craftsmanship and Special Editions 102

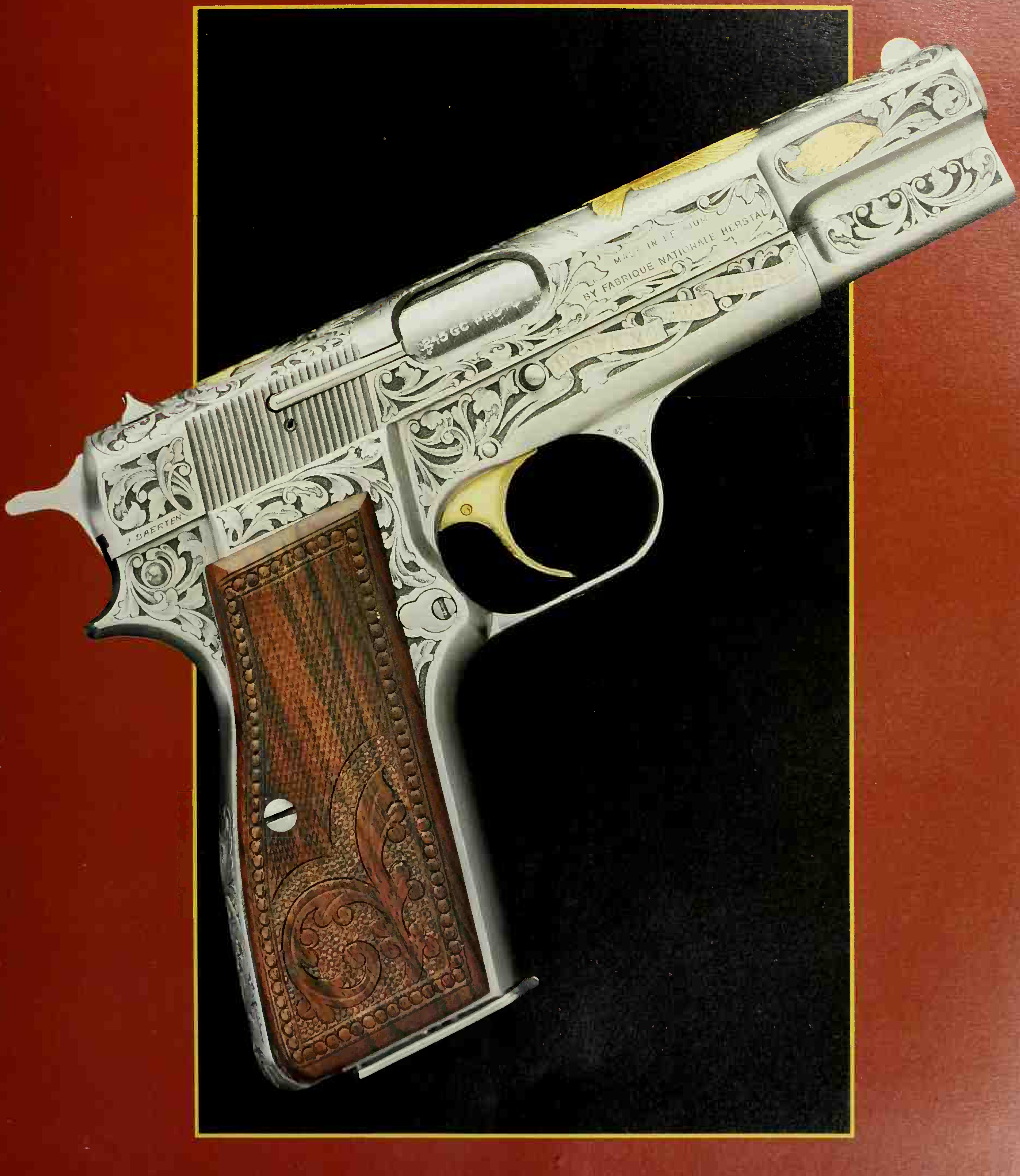
Colt 118
The Arms of Samuel Colt 122
Metallic Cartidges 154
Great Colts of the Nineteenth Century 158
The Evolution of the Modern Colt Revolver 166
Automatic Pistols and Rifles 174
Craftsmanship in the Twentieth Century 182
Excellence and Art 206
The Tradition Continues 214

Remington 218
A Remington History 222
Civilian Arms 226
Military Arms 246
Remington Ammunition 270
Eliphalet Remington's First Gun 286
How E Remington Entered the Arms Trade 302
The Death of E Remington Senior 306
A Glossary of Remington Arms 310

Winchester 322
Oliver F Winchester's Company 326
Winchester and the Age of Smokeless Powder 334
The Company Enters the Twentieth Century 350
The Western Cartridge Company 358
Winchester Today 362
Major Browning Winchester Models 370
Major Winchesters Through the Years 388
Glossary of Terms 420
Index 428

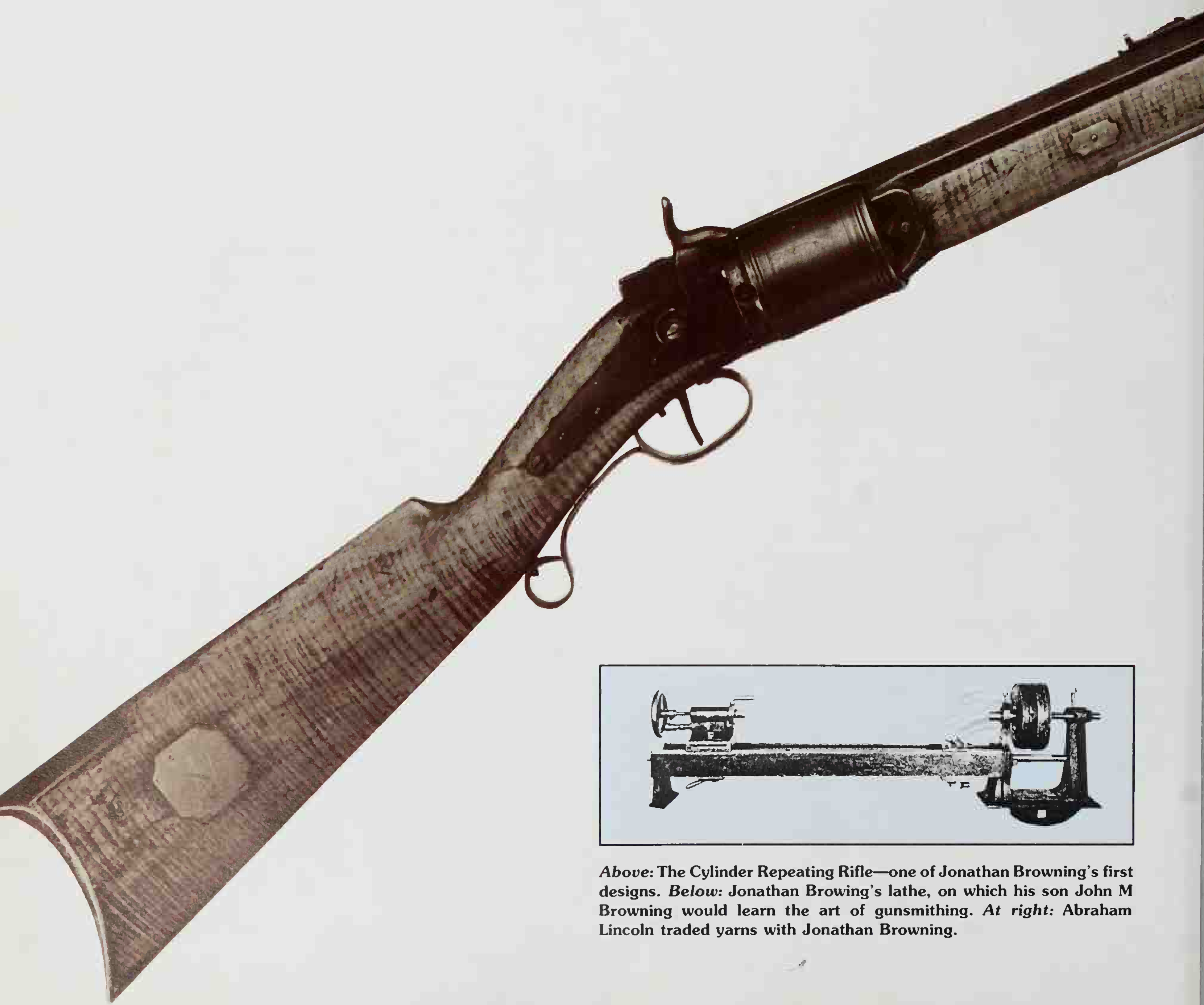
America's Premier Gunmakers

BROWNING


MADE IN BELGIUM
BY FABRIQUE NATIONALE HERSTAL
J. BAERTEN

Previous pages: **A beautifully crafted Browning Gold Classic automatic pistol.** ***These pages:*** **Two excellent Browning hammerless doubles, manufactured by Miroku Firearms Mfg of Japan. Note the master engraving and the fine wood stocks. These are shotguns that would be at home both on the field and on display.**

Jonathan and His



Above: The Cylinder Repeating Rifle—one of Jonathan Browning's first designs. *Below:* Jonathan Browing's lathe, on which his son John M Browning would learn the art of gunsmithing. *At right:* Abraham Lincoln traded yarns with Jonathan Browning.

Browning Guns

The Father of the Son

Jonathan Browning, destined to be the father of one of the world's great gunmakers, was born on 22 October 1805 at Brushy Fork of Bledsoe Creek in Summer County, Tennessee. He was an industrious, talented fellow, and fixed up his first gun at the tender age of 13, while he was apprenticed to a local blacksmith.

By the time he was 19, Jonathan was considered to be a competent gunsmith, and he forged his own tools for his gunsmithing work. Some of these tools were still in use in the twentieth century, as Jonathan's son John Moses Browning found the old tools also served him well in his shop in Ogden, Utah.

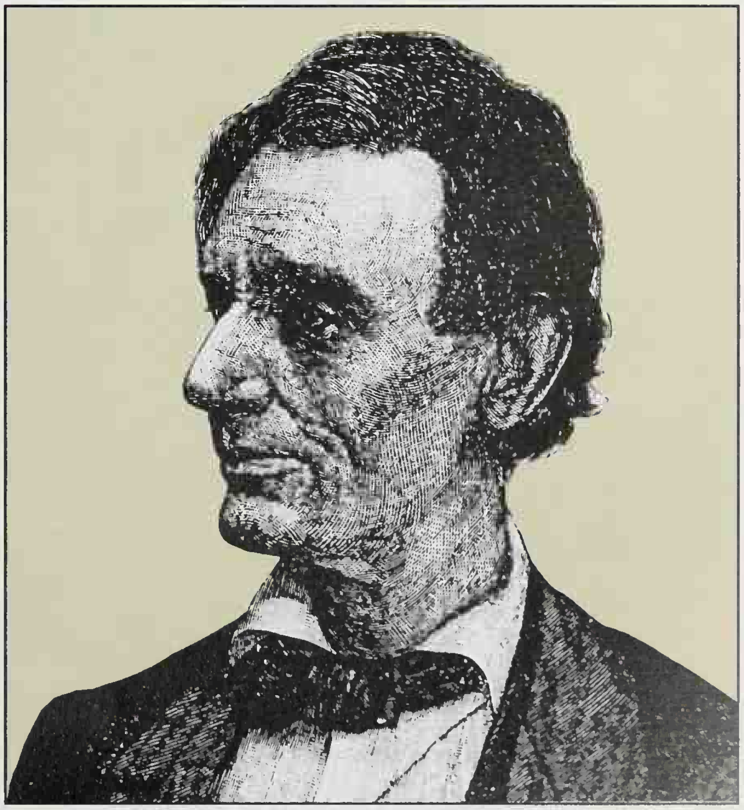
On 9 November 1826, one month after he became 21, Jonathan married Elizabeth Stalcup. Their first child was born in August of the following year, and Jonathan's first gun shop was established at Brushy Fork. He worked there from 1824 to 1834.

While none of them survive, at least some of the guns he made at Brushy Fork saw action in the Seminole Wars of 1836, and in the Civil War (to which many combatants brought their own personal weapons).

Jonathan eventually moved to Quincy, Illinois, then a settlement of 753 people. He invented both his Slide Bar Repeating Rifle and his Cylinder Repeating Rifle in Quincy—descriptions of both of which follow this biography. His gunsmithing business in Quincy flourished, and he entered a period of comfortable prosperity about the time he was elected Justice of the Peace. By the time he was 35, Jonathan had eight children.

Through his lawyerly cousin, Orville H Browning, Jonathan made the acquaintance of a young Illinois lawyer by the name of Abraham Lincoln. Lincoln spent the night in the Jonathan Browning home on at least two different occasions, and the wise, folksy cameraderie between the two men was a Browning family staple for generations.

Also during his middle 30's, Jonathan became interested in religion. The Church of Jesus Christ of Latter-Day Saints,



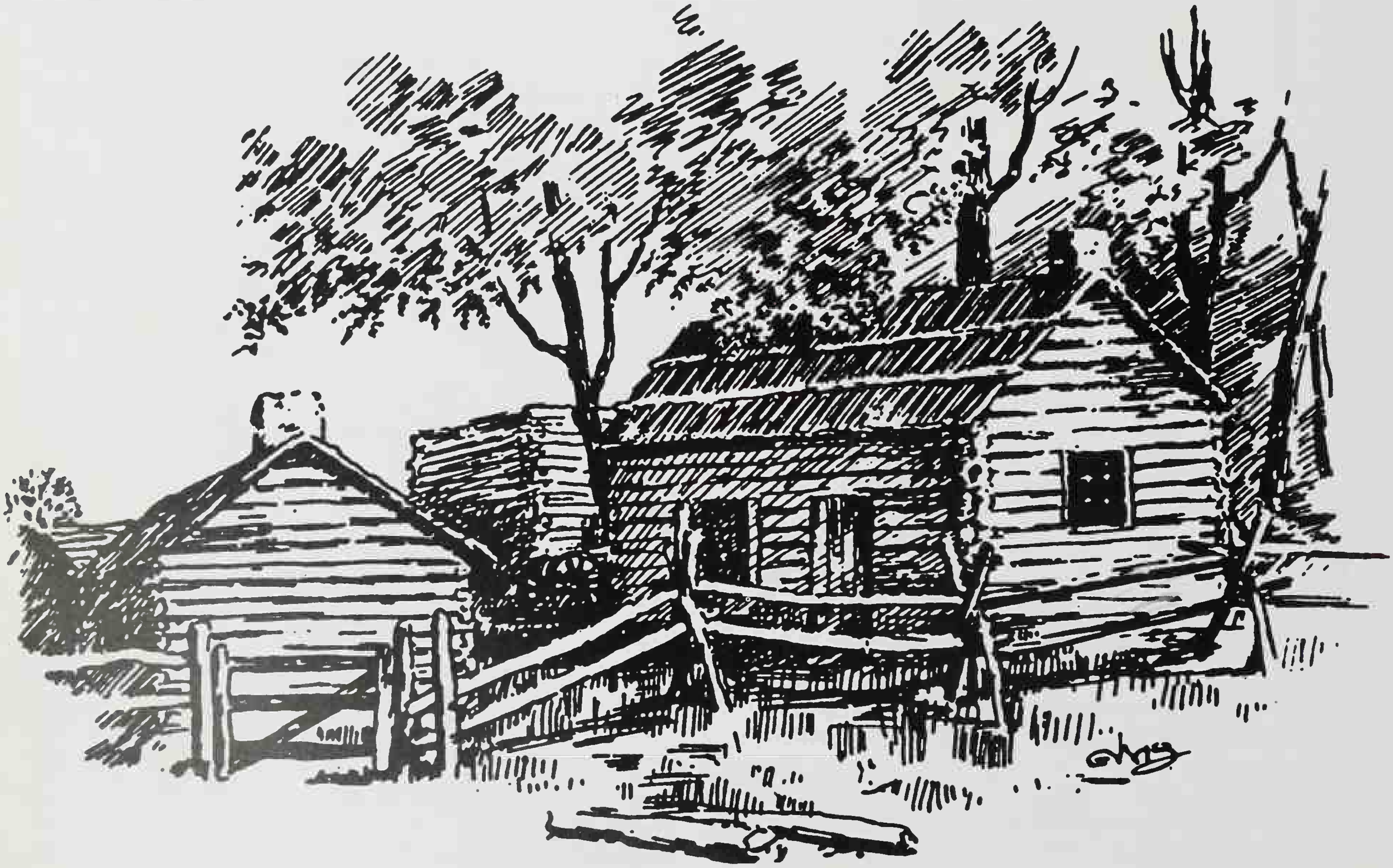
commonly referred to as the Mormon Church, had its beginnings in New York state. Due to continuous persecution, church leader Joseph Smith led the Mormons to the banks of the Mississippi River and founded a settlement which he named Nauvoo (from the Hebrew word denoting a beautiful place). Within a year they had filled the swamp and turned Nauvoo into a city laid out in large square blocks with over 250 houses. Converts were arriving in large numbers, and in a few short years, Nauvoo became the largest city in Illinois. Sometime in 1840, Jonathan was converted to Mormonism, and shortly thereafter, moved to Nauvoo where he set up a two story brick residence, with the first floor serving as his gun shop.

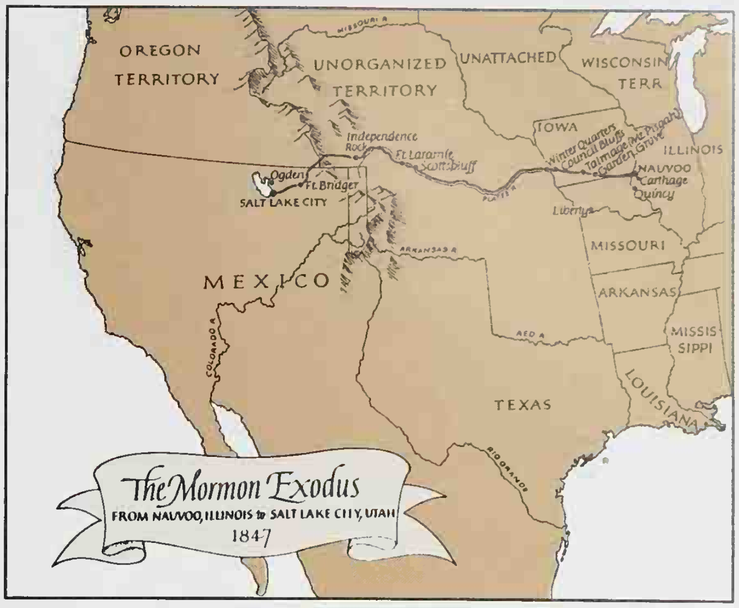
On 27 June 1844, Joseph Smith and his brother Hyrum were murdered by a mob in Carthage, Illinois. Brigham Young became leader of the Mormons. Figuring that the persecution wouldn't stop, he immediately began to follow through on an old contingency plan to leave what was then the United States and settle the Latter-Day Saints in the Rocky Mountains.

In the midst of this exodus, a message arrived from the President of the United States requesting that the Mormons supply 500 or so volunteers for the war against Mexico which was then raging. Jonathan Browning added himself to the lists of the Mormon Battalion but Brigham Young forbad him to go.

Jonathan's gunmaking skills were far more important to the success of the Mormon migration to the west, than any fighting skills he could offer to the US in the war with Mexico. So it was that Jonathan provided the Utah pioneers with both his Slide Repeating Rifle and his Cylinder Repeating Rifle, both of which operated according to the tenets of simple construction, easy operation and accurate efficiency.

Above: Jonathan Browning, father of John M Browning. _Below:_ Jonathan Browning's home and gunsmith shop at Brushy Fork of Bledsoe Creek, Tennessee. _Right:_ Jonathan Browning's home in Nauvoo, Illlinois. _Far right:_ Map tracing the Mormon Exodus from Nauvoo, Illinois to Salt Lake City, Utah. Jonathan Browning's guns aided the Mormons in their journey westward.





The Brownings and some of their Mormon companions were told to set up a settlement for a while at Kanesville, Iowa, and here they paused in their exodus.

On 24 July 1947, Brigham Young led the advance company of pioneers down into the Salt Lake Valley, and in 1852, Jonathan was permitted to load his wagons and follow the westward trail. Jonathan settled his family in Ogden, Utah. He never again applied himself to the inventing of new guns, as his talents at being a mechanic and engineer were in great demand, due to the constant battle for survival against the elements in that frontier community.

Jonathan and Elizabeth had 11 children by then, and two years after their arrival, he married Elizabeth Clark, who became the mother of John Moses Browning, his brother Matt, and a daughter who died in infancy. A few years later, he married Sarah Emmett, who bore him seven more children, for a grand total of 22! Jonathan Browning died on 21 June 1879 in his 74th year. He had had time enough to become glad in the knowledge that he had sired, in the person of his son John Moses, a greater gunmaker than himself, and had helped to give direction to his talent.

Jonathan Browning's Guns

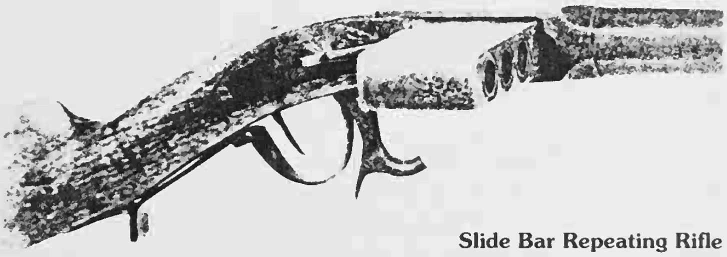
Slide Bar Repeating Rifle. This is a percussion repeating rifle of approximately .45 caliber, with an ingenious magazine that holds five (or 25) shots. It has a 40.3-inch octagon barrel, and weighs 9.9 pounds.

One of the earliest known American repeating rifles, this firearm was invented by Jonathan Browning sometime between 1834 and 1842 while he was residing in Quincy, Illinois. It was never patented, but was manufactured by its inventor during his residences in Quincy and Nauvoo, Illinois; and Kanesville, Iowa—altogether, from 1842—1852. The total number manufactured is not known.

The Slide Bar Repeater has a number of particularly ingenious features, including its five-shot magazine (a 25-shot variant was available) that takes hand loads. The mechanism centers around a rectangular iron bar with five percussion chambers—for the hand loads—bored in it. This slides through an aperture at the breech and is manually operated.

Since it is an underhammer firearm, the shooter can ease his index finger forward from the trigger to cock the rifle, thus never having to drop the gun from his shoulder during a firing session. Also, having the percussion chambers located in the bar permits comparatively fast 'mass production' loading, and provides the single-barrel firearm with the capability of firing five (or 25) shots in comparatively rapid succession. A thumb-operated lever, on the right-hand side of the breech, forces the slide against the barrel as each load moves into line with the bore. This creates a gas-tight seal.

The Jonathan Browning Slide Repeating Rifle is not only one of the earliest repeating rifles ever made, it is also one of the simplest—both in its small number of parts and its ease of operation.



Slide Bar Repeating Rifle

Cylinder Repeating Rifle. This is a six shot repeating percussion rifle of approximately .45 caliber, with a six-shot cylindrical magazine. It has a 29.9-inch half octagon, half 16-sided barrel and weighed 12.1 pounds.

The Cylinder Repeating Rifle was invented by Jonathan Browning during his residence in Quincy, sometime between 1834 and 1842. Like the Slide Repeating Rifle, it was never patented. Also, this rifle was not manufactured after Browning arrived in Utah in 1852. The total number manufactured is not known.

The powder and ball are loaded into the cylinder chambers and a percussion cap is placed on each nipple. The rifle is cocked by drawing back the hammer, but there is no mechanism for revolving the cylinder when the hammer is cocked; the cylinder has to be rotated manually after each shot.

The front edge of the cylinder has a tapered cone around each chamber which fits into the breech of the barrel. There is a conical cam in the rear of the receiver, which, when engaged, jams the cylinder tight against the breech of the barrel. This cam traverses horizontally through the receiver immediately to the rear of the cylinder.

John Moses

Above: Continuing the Browning tradition of classic styling, the BL-22 Lever Action Rifle offers the best in modern gun design. Its versatile action mechanism handles .22 caliber short, long or long rifle cartridges—separately or in combinations.

Browning

The Man of Inventions

John Moses Browning was born 29 January 1855 in Ogden, Utah. His first toddling steps were toward his dad's gun shop. Family remembrances indicate that he actually started his career at about age six when he dragged a box into the shop to serve as his own work bench and, about a year later, the seven year old was beginning to take himself seriously as a gunsmith. The first gun that John made was composed of the smashed barrel of an old flint lock, a stick of wood, a piece of wire and a scrap of tin.

In 1869, the transcontinental railroad was completed and the Mormons were no longer isolated, but were tangibly connected to both coasts of the country. Just as Utah then stood astride a growing America, so in a few years would John Browning find himself squarely astride new firearms developments. His father had watched the percussion lock gradually replace the flintlock, and now John witnessed the passing of the percussion lock and the introduction of the cartridge firearm.

His father's gun shop was reconditioned in 1873, and it was here in 1878 that John invented the first of his many famous guns—the 1878 Single Shot Rifle, for which John received $8000 from the Winchester Repeating Arms Company.

Thus began a long and profitable relationship between Winchester and Browning. When he was just 27 years old, John invented what would later become the Model 86 Winchester. This was a milestone in firearms design, and it was so efficient that it remained in the Winchester line for over 70 years. In 1887, he invented a lever action repeating shotgun.

John Browning did most of his designing in his own head, and before undertaking the making of a particular model, he had it completely visualized through completion. He never thought that faculty to be unique; he supposed that it was a common attribute. He would, however, use sketches and templates to prove to himself that the designs were indeed sound mechanical concepts.

Although he drew no blueprints, he would make numerous measurements, and would carefully denote them. When the work was going well, John often whistled or sang, and once commented that the sounds of the machines and tools were an orchestra to his ear. Whenever he became stumped over some particular difficulty he fell silent, and when frustration built to a certain point, he simply worked harder as though the tension generated a heat that consumed all obstacles.

Once, he was asked how he managed to create a gun of precise parts and functions with no other instruments of measurement than an inside and outside caliper, a compass (which also served as a scriber), a foot rule graduated down to 64ths and a little spirit level he'd inherited from his father. He smiled and replied, 'Why, I went at the job about the same way I've gone at every other job. I find a good starting place, a fixed point—like the North Star—from which I make exact calculations and then I calculate.'

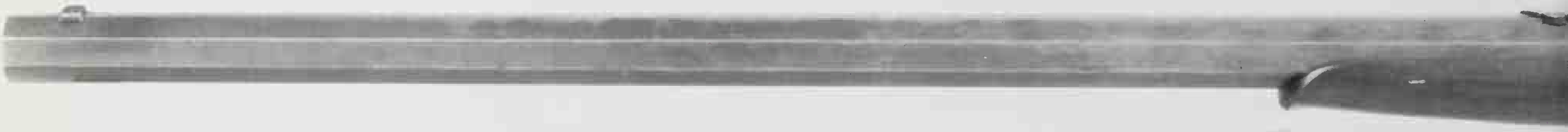
Once a model was completed, he spent considerable time testing it in the hills behind Ogden and even asked his wife, Rachel, to operate the various prototypes to see if she could

easily work the mechanism. This same inventive process went on all his life, model after model.

As was noted earlier, John's association with the Winchester Repeating Arms Company began with their purchase of his Single Shot in 1883 and lasted 19 years until 1902. During that period John—being freed from the burdens of running an arms-manufacturing shop—was able to devote nearly all of his time to inventing. And invent he did! For nearly 20 years Winchester's new firearms were all Brownings (although never known as such), and 34 of the guns purchased by Winchester were never manufactured; the Winchester line could not have absorbed them, but by purchasing them, Winchester kept them out of the hands of its own competitors.

In effect, Winchester was employing John to work exclusively for them and instead of paying him a fixed salary, he was given his asking price for every gun design he submitted. John's prices were high but at the same time Winchester became the world's leading manufacturer of sporting arms. Browning had more patents for firearms designs than any other American inventor during that period.

Browning invented the Winchester Model 1894 Lever Action Repeating Rifle which has been acclaimed 'the most popular hunting rifle ever built, bar none!' The model 1894 was America's first smokeless-powder sporting rifle. It is interesting to note that all of John's rifle designs for Winchester were designed for black powder cartridges, and yet were later adapted to the much more powerful smokeless cartridges, with only a change of barrel steel. John's philosophy was stated thusly: 'If anything can happen to a gun it probably will sooner or later.' He therefore set his margins of safety far in excess of merely adequate requirements, as if to say, 'make it strong enough, then double it.'



Because of John M Browning's genius, Winchester was the only company in the world with a complete line of sporting arms with not a single model facing a competitor that was even remotely dangerous. By 1900, fully 75 percent of the repeating sporting arms on the American market, both lever and pump action, were of John Browning's invention.

However, Winchester's monopoly was to end in 1902 when its president, TG Bennett, refused to pay Browning royalties for a new invention known as the automatic shotgun. In all of its dealings with Browning the Winchester Company had never paid him a royalty but simply bought his inventions outright. However, an automatic shotgun had no precedent, and Browning figured that it would sell like hotcakes, and righfully wanted in on its sales as a pioneering innovator, while Winchester concluded that it would take too long to perfect, and so refused his offer.

Winchester regretted this mistake, for more than 54 years were to pass before another successful autoloading shotgun was developed. Also, thus was cemented the already extant, and eventually long, Browning association with Fabrique Nationale of Herstal, Belgium—who did accept John Browning's offer.

The automatic shotgun, machine guns, and pistols of John M Browning owed their birth to an event in the fall of 1889. At a shooting match, John's attention was riveted by the clump of sweet clover that stood over to one side of his brother Will's shooting stand: it was forcefully moved by the muzzle blast of Will's gun. John thought, 'Now, why can't we use all that wasted energy to help operate the gun?' When he had rounded up his brothers and they ran back towards the gunshop, everyone knew that John was in an inventing frame of mind.

'Yes, sir!' John exclaimed, from the sheer excitement of the idea that was still expanding in his mind, 'An idea, as

Above and below: **Two views of a Browning Single Shot Rifle—John M Browning's first firearm. A 'falling block' style rifle, this was a successful beginning of a great career for John M Browning.** ***Left:*** **Rachel Teresa Child, shortly before she married John M Browning.** ***Above:*** **Matt Browning, a favorite among John's many brothers.**

Pappy used to say—biggest one I ever had. Get that damn horse going, Matt.'

'Why, it might even be possible to make a fully automatic gun,' he surmised aloud, 'one that would keep firing as long as you had ammunition.'

As soon as they reached the shop, John took an old .44 caliber Model 73 and wired it to a board, with the rifle lying flat on its side. They nailed the board to the floor. Then they drilled a hole slightly bigger than the old rifle's bore size in a length of two-by-four, and then put it on the floor about a quarter inch from the barrel, with the board's hole lined up with the rifle's bore.

'What happens to that block of wood is what we want to see,' John explained. After a few safety precautions had been arranged they were ready to begin. When they touched the rifle off, the board came to rest only when its momentum had been spent in a ricocheting course of leaps from one obstacle to another. The gas pressure from the rifle proved to be every bit as powerful as John had surmised upon his observation of the sweet clover at the shooting match.

Turning to his brothers he said, 'You know, we may not be more than 10 years away from a pretty good automatic machine gun.' Speaking of that moment later, John's brother Matt said, 'John had Ed and me as excited as a couple of kids at a circus. And then he tells us that we may have a pretty good machine gun, in 10 years.' John was really arguing with himself aloud. He admitted that it did look as though they had stumbled onto something new, the possibility of an automatic gun, operated by the gas that had been wasted since the first shot was fired through a barrel. But, he cautioned, they shouldn't get too excited. 'But,' he concluded, 'it ought to be interesting. Anyhow, Ed, in the morning we'll make a gas-operated gun.' 'Figure doing it by noon?' Ed asked with an in-on-the joke wryness. 'Hardly,' John replied. 'About four o'clock I'd guess.' The laughter broke the tension of that momentous day.

On 22 November 1890 John's brother, Matt Browning, sat down and wrote a letter which in time would have tremendous military significance. It was written in long hand on Browning Brothers' stationary and was addressed to Colt's Patent Firearms Manufacturing Company of Hartford, Connecticut. Complete with the author's homespun usages, it read:

Dear Sirs:

We have just completed our new Automatic Machine Gun & thought we would write to you to see if you are interested in that kind of a gun. We have been at work on this gun for some time & have got it in good shape. We made a small one first which shot a 44 W.C.F. charge at the rate of about 16 times per second & weighed about 8#. The one we have just completed shoots the 45 Gov't chge about 6 times per second & with the mount weighs about 40#. It is entirely automatic and can be made as cheaply as a common sporting rifle. If you are interested in this kind of gun we would be pleased to show you what it is & how it works as we are intending to take it down your way before long. Kindly let us hear from you in relation to it at once.

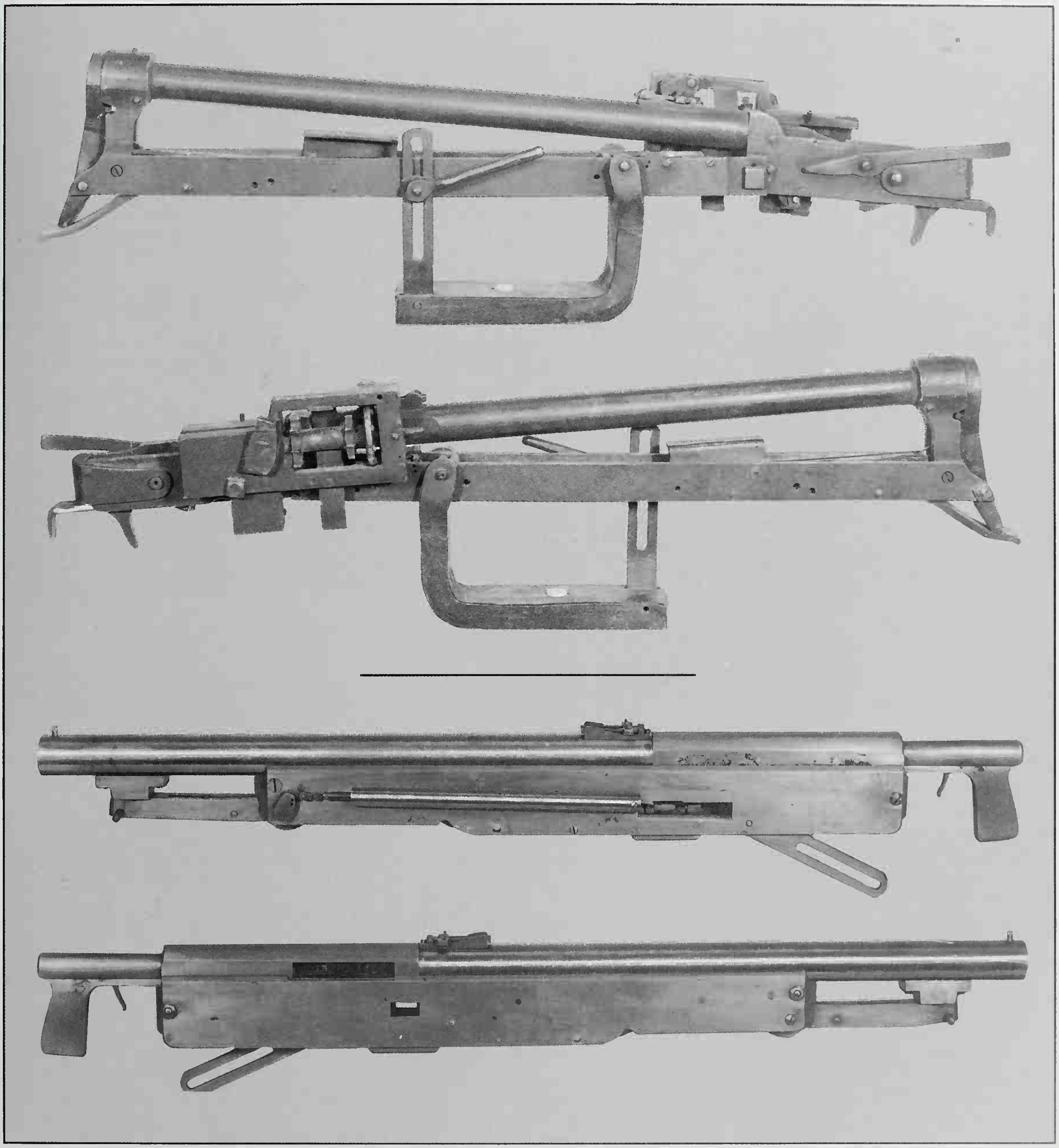
Yours very truly,
Browning Bros

***Above and below right, respective views:* The prototype, and a refined version, of Browning's gas-operated machine gun. *Below:* Browning with his 37mm aircraft cannon. *Overleaf:* Browning automatic shotguns.**

Browning's first gas-operated machine gun could fire 600 rounds per minute, while Gatlings of that period had a rate of fire of 1000 rounds a minute but required manual rotation of the mechanism to be fired. By 1895, John's gas-operated machine gun had been developed to such a high degree of efficiency that it was officially adopted by the United States Navy. His first automatic shotgun patent was filed in 1900, and by that year, both Fabrique Nationale and Colt's Patent Firearms Manufacturing Company had Browning Automatic Pistols in production.

All this was accomplished with no curtailment in John's inventing of more conventional rifles and shotguns, as well as miscellaneous inventions such as a machine for loading of machine gun belts invented in 1899 at the request of the Ordinance Board. The Browning Automatic Rifle was officially adopted by the United States in 1917 while the Government .45 Caliber Automatic Pistol had become the official United States military sidearm six years earlier in 1911.

In 1917 the US Government offered John Browning $750,000 for rights to his automatic firearms, and Browning patriotically accepted this sum, knowing that, had the Government paid him standard royalties for the use of these designs, he would have received almost 13 million dollars.



SPECIAL STEEL—12 GAUGE
SAVE this Booklet...
on the Operation and Care of
GENUINE BROWNING
nder and Automatic Shotguns
BROWNING
ARMS COMPANY
Reg. U.S.
Pat. Off.
ST. LOUIS,
MISSOURI

In September 1918, Browning tested his .50 caliber machine gun, which was the 'big brother' to the .30 caliber machine gun that had seen lots of action in World War I. Both of these machine guns saw heavy use—both on the ground, and as aircraft armament—in World War II, and are still in limited use at the present time. In a report from the commanding officer of the US Army Air Force dated November 1943, the .50 caliber Browning machine gun was cited as 'the most outstanding aircraft gun of the Second World War.'

Even Reichsmarshall Herman Goering admitted that 'If the German Air Force had had the Browning .50 caliber, the Battle of Britain would have turned out differently.' To date, no fewer that 66 different known models of the Browning Recoil Machine Gun have been made. The latest aircraft models were stepped up to a cyclic rate of fire of 1300 rounds per minute in the .30 caliber and 1200 per minute in the .50 caliber. Indeed, 'Browning' has come to be a household word. The term 'browning' appears in many French dictionaries as a common noun, uncapitalized, defined as 'one of the pistols designed by the American inventor, John M Browning.'

John M Browning died the day after Thanksgiving 1926 at the Fabrique Nationale plant in Liège, Belgium. The cause of his death was attributed to heart failure. A bronze plaque hangs in the Fabrique Nationale factory in Liège. On it is the likeness of a man, neither young nor old but balding, with a medium-full mustache, an intent serious look in his the eyes, and just a hint of amusement in the lines of his mouth. The French on the plaque reads, in English,

'To the Memory of John M Browning 1855—1926. Thirty years previous, he came to this place from Ogden to have his first automatic pistol manufactured, and on the 26th of November, 1926, while he was busily engaged at work, death overtook the greatest firearms inventor the world has ever known.'

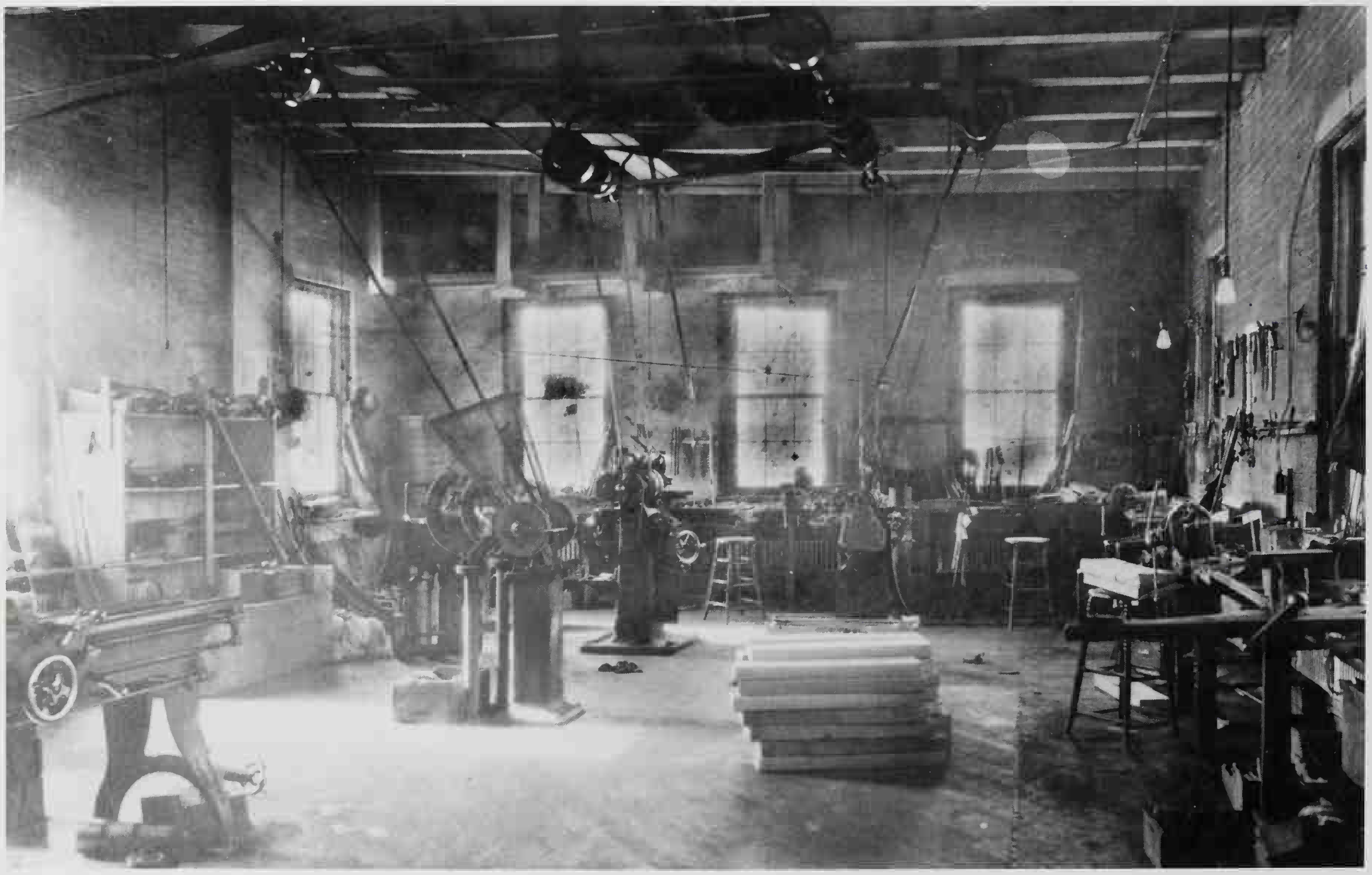
In his lifetime John M Browning took out a total of 128 patents covering more than 80 separate and distinct firearms. Upon John Browning's death the presidency of Browning Arms went to John's son, Val, a respected firearms inventor in his own right with 38 patents to his name, and a generous benefactor of colleges and hospitals. Val was even decorated by Belgian royalty. In turn, Val Browning's son, John Val, was president of Browning Arms for 14 years until just before it was acquired by Fabrique Nationale in 1977.

Today, John M Browning's designs remain the staples of the firearms industry, however, the involvement of the Browning family in the company ended with the FN stock buyout. Today, Browning North America, headquartered in Mountain Green, Utah, has divested itself of all product lines not directly related to hunting and fishing.

Firearms manufacturing is split between Asia and Europe with two-thirds of the guns being built by Miroku, a Japanese company that has made only Browning guns for the past 20 years. Fabrique Nationale itself makes the other one third. With total sales approaching $150 million a year, Browning is clearly the market leader in sales of high quality rifles and shotguns as well as home safes.

In January 1988, Browning acquired 37 percent interest in Winchester. Browning Arms has a heritage and a pride in true craftsmanship that continues to satisfy its firearms buffs from generation to generation.

Below: The Browning shop in Ogden, Utah, at about the turn of the century. _Right:_ The patent drawings for Browning's John M Browning's Single Shot Rifle.



J. M. BROWNING.
Breech-Loading Fire-Arm.

No. 220,271. **Patented Oct. 7, 1879.**

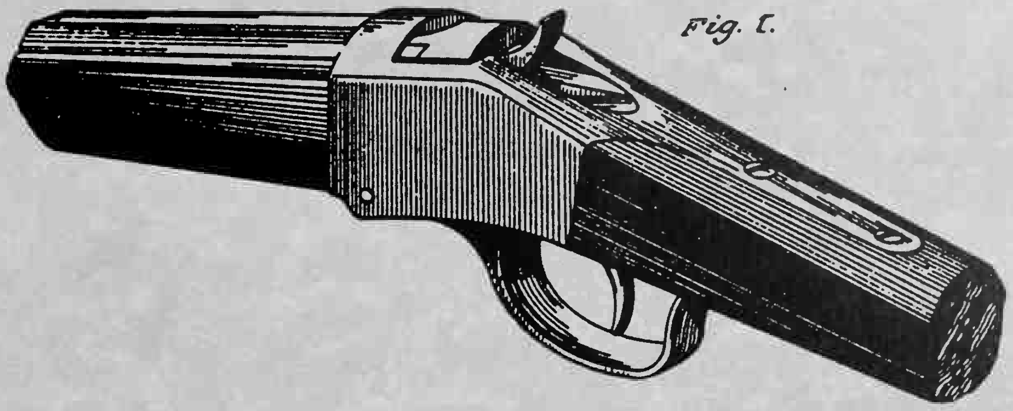


Fig. 1.

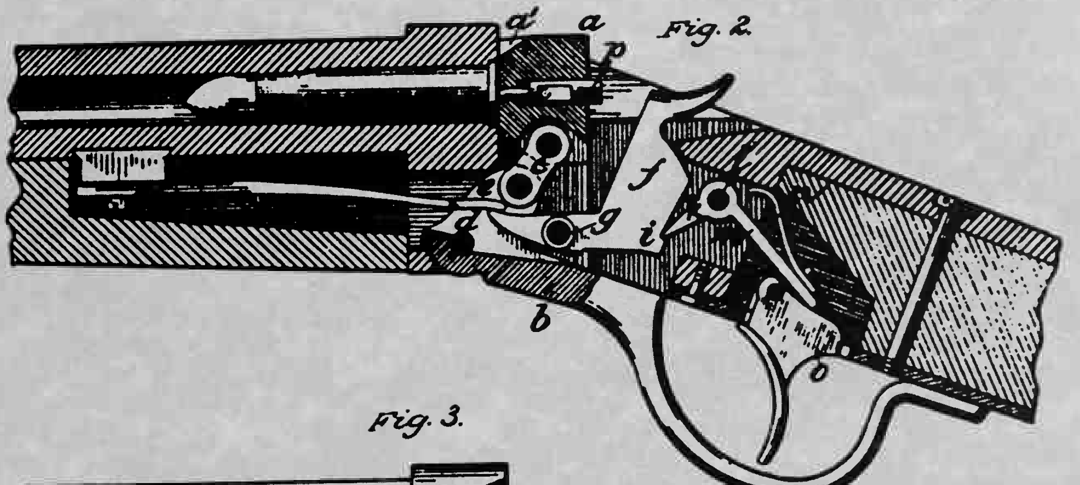


Fig. 2.

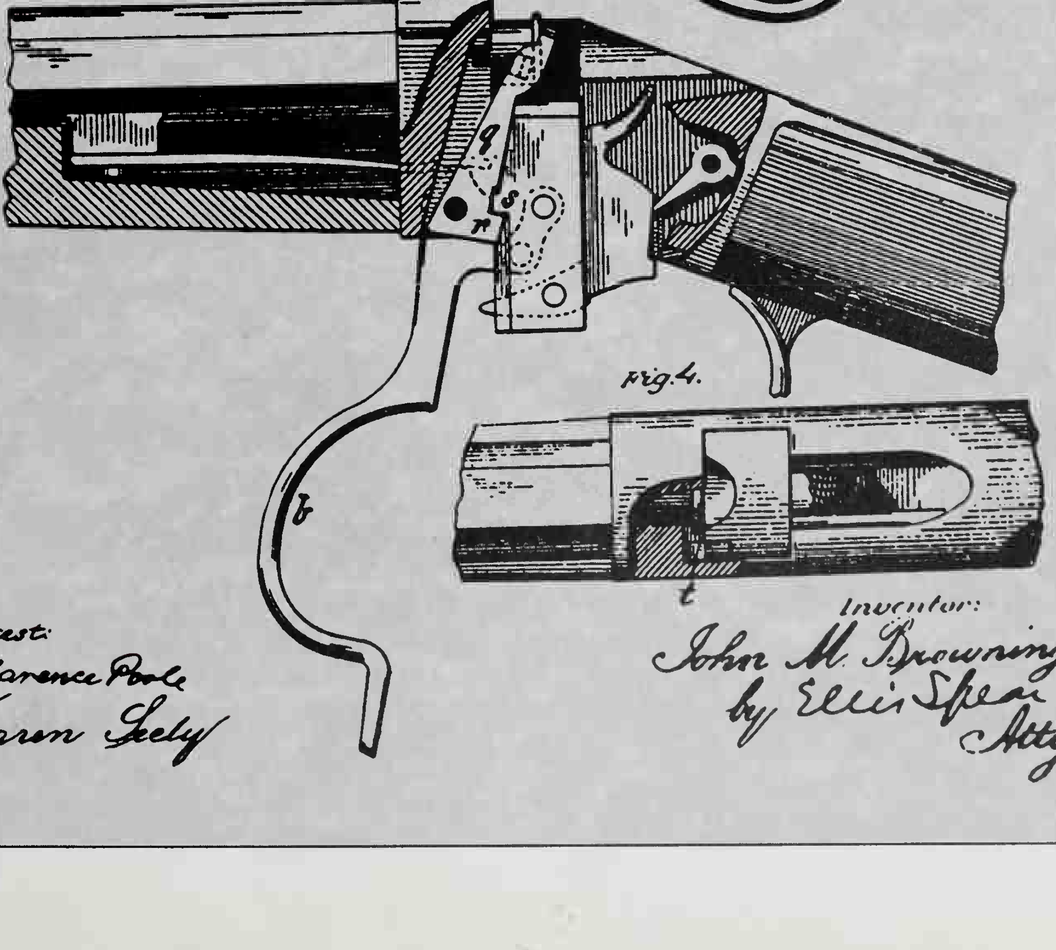


Fig. 3.

Fig. 4.

Attest:
C. Clarence Poole
Warren Seely

Inventor:
John M. Browning
by Ellis Spear
Atty

John M
Pistols

FABRIQUE NATI
BROW

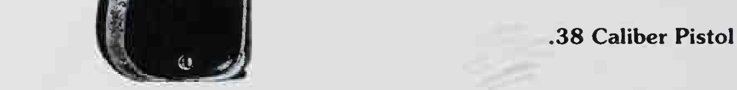
A Selection of John M Browning's Pistols

Semiautomatic .38 Caliber Pistol. This is a gas-operated semiautomatic pistol of .38 caliber, with a pistol-grip magazine, a hammer safety and fixed sights. It has a 5.75-inch barrel and weighs 2.1 pounds. It was the first of John M Browning's many semiautomatic pistol designs and was invented in 1894–95. This pistol is a logical outgrowth of Browning's development of the gas-operation principle, which during the preceding five years he had applied primarily to machine gun models.

A gas vent is located on the top of the barrel a short distance from the muzzle, over which is positioned a piston lever, linked to the breech bolt. As the expanding gases from the detonating cartridge pass through the vent, sufficient pressure is exerted on the lever to force it upward and rearward in an arc. The rearward movement opens the breech bolt, causing it to extract and eject the fired cartridge and cock the hammer. Then, as the lever and breech bolt return to their forward position, a fresh cartridge is fed into the chamber, readying the pistol for the next round.

The patent application for this firearm was filed 14 September 1895, and US Patent Number 580,923 was granted 20 April 1897. On 3 July 1895, the pistol was test-fired by officials of Colt's Patent Firearms Manufacturing Company in Hartford, Connecticut. On 24 July 1896, American manufacturing and sales rights on this pistol (and three others) were assigned to the Colt Firearms Company.

This agreement became the basis for all subsequent agreements between Browning and Colt, even though this particular pistol was never commercially produced. From the day of the agreement, Colt has produced semiautomatic pistols exclusively of the basic Browning design.



.38 Caliber Pistol

Semiautomatic .32 Caliber Pistol. This is a blowback-operated semiautomatic pistol of .32 caliber, with a pistol-grip magazine, a hammer safety and fixed sights. It has a six inch barrel and weighs two pounds. John M Browning invented this pistol in the fall of 1895, and it differs from his first semi-auto design in that the blowback principle, not gas pressure per se, is the basis of its operation. It was test-fired by Colt officials on 14 January 1896, and American

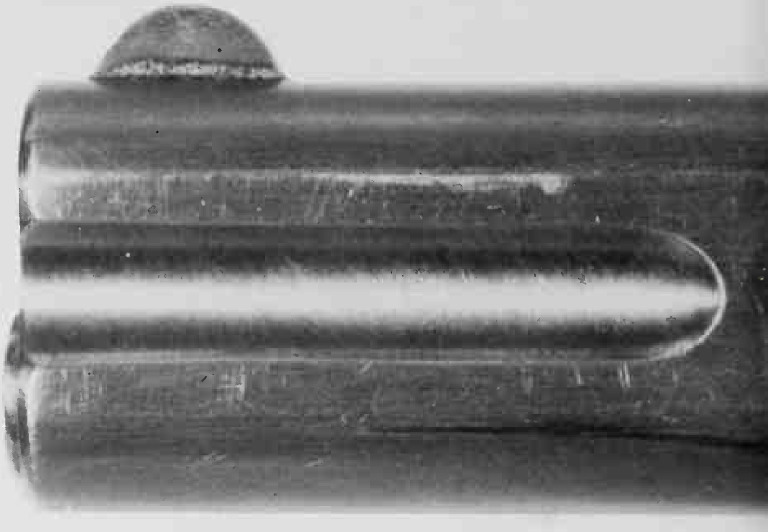
Browning's and Rifles

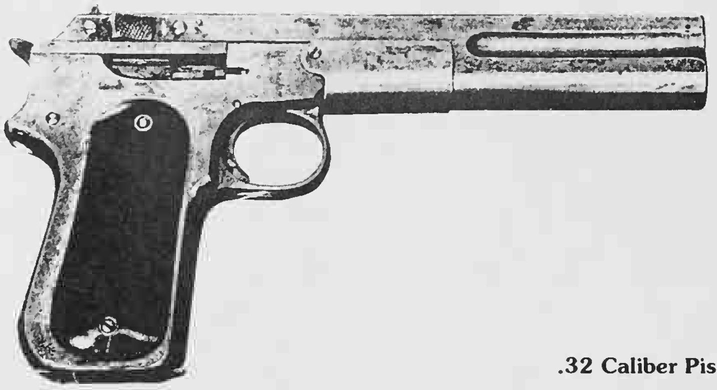
ALE HERSTAL BELGIQUE
'S PATENT DEPOSE

A weapon renowned for its performance and reliability, the 9mm Hi-Power automatic pistol *above* is one of the many Browning designs manufactured by Fabrique Nationale in Liège, Belgium. The last of John M Browning's pistol designs, it incorporates the improvements and innovations of a quarter century of pistol design.

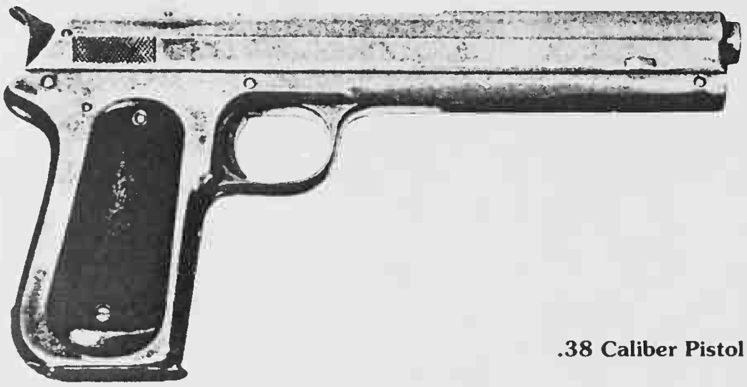
manufacturing and sales rights were assigned to Colt on 24 July 1896. The patent application was filed 31 October 1896, and US Patent Number 580,926 was granted 20 April 1897. This pistol was never commercially produced.

The expanding pressures within the cartridge case act directly on the breech bolt through the cartridge base, forcing it backward and effecting cartridge ejection and cocking during the rearward movement. A spring located above the barrel provides the energy to slam the bolt shut again, and as the bolt is closing, it catches a fresh cartridge from the pistol-grip magazine, shoving it into the chamber, ready for firing. The slide and breech bolt are integral, and as with any blowback action, must provide sufficient inertia to delay rearward movement until the bullet leaves the barrel and gas pressures have partially diminished.





.32 Caliber Pistol



.38 Caliber Pistol

Semiautomatic .38 Caliber Pistols. These are both semiautomatic pistols of .38 caliber, with positive-lock, recoiling barrels. They each have a pistol-grip magazine and a hammer safety. One of these pistols was designed with fixed sights, and the other with no sights. Both have an 8.9-inch barrel and weigh two pounds. These two pistols were forerunners of the Colt Model 1900. They were invented in 1896 and manufacturing and sales rights were assigned to Colt on 24 July of that same year.

Patent Application Number 67 was filed on 31 October 1896 and US Patent Number 580,924 was granted on 20 April 1897. Patent Application Number 68 was filed on 7 November 1901, and US Patent Number 708,794 was granted on 9 September 1902. Neither of these pistols was commercially produced.

These are the first Browning pistols to employ a positively locked, recoiling barrel. The top of the barrel has tranverse ribs and recesses which fit into corresponding ribs in the slide. Each end of the barrel is attached to a link which, when the barrel is in battery position, presses the barrel tightly upward against the slide and thereby interlocks these ribs and recesses. Thus, in firing, the barrel and slide are locked together with a secure seal at the breach.

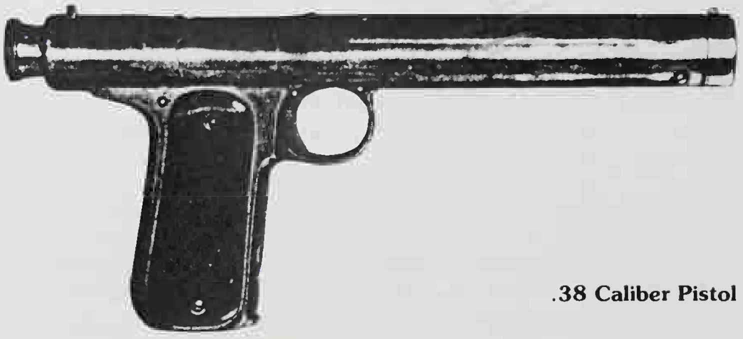
In discharging a cartridge, the barrel and slide recoil—locked together until the bullet has left the barrel and gas pressures diminish—at which point the barrel links draw the barrel downward out of the locking recesses, freeing it. The slide alone continues to move rearward, accomplishing the extraction, ejection and cocking functions in the process. The slide is slammed shut by springs, and as it shuts, it chambers a new cartridge from the pistol-grip magazine, readying the firearm for another shot.

Both of these pistols were originally designed to eject from the top, and were later modified to eject from the side.

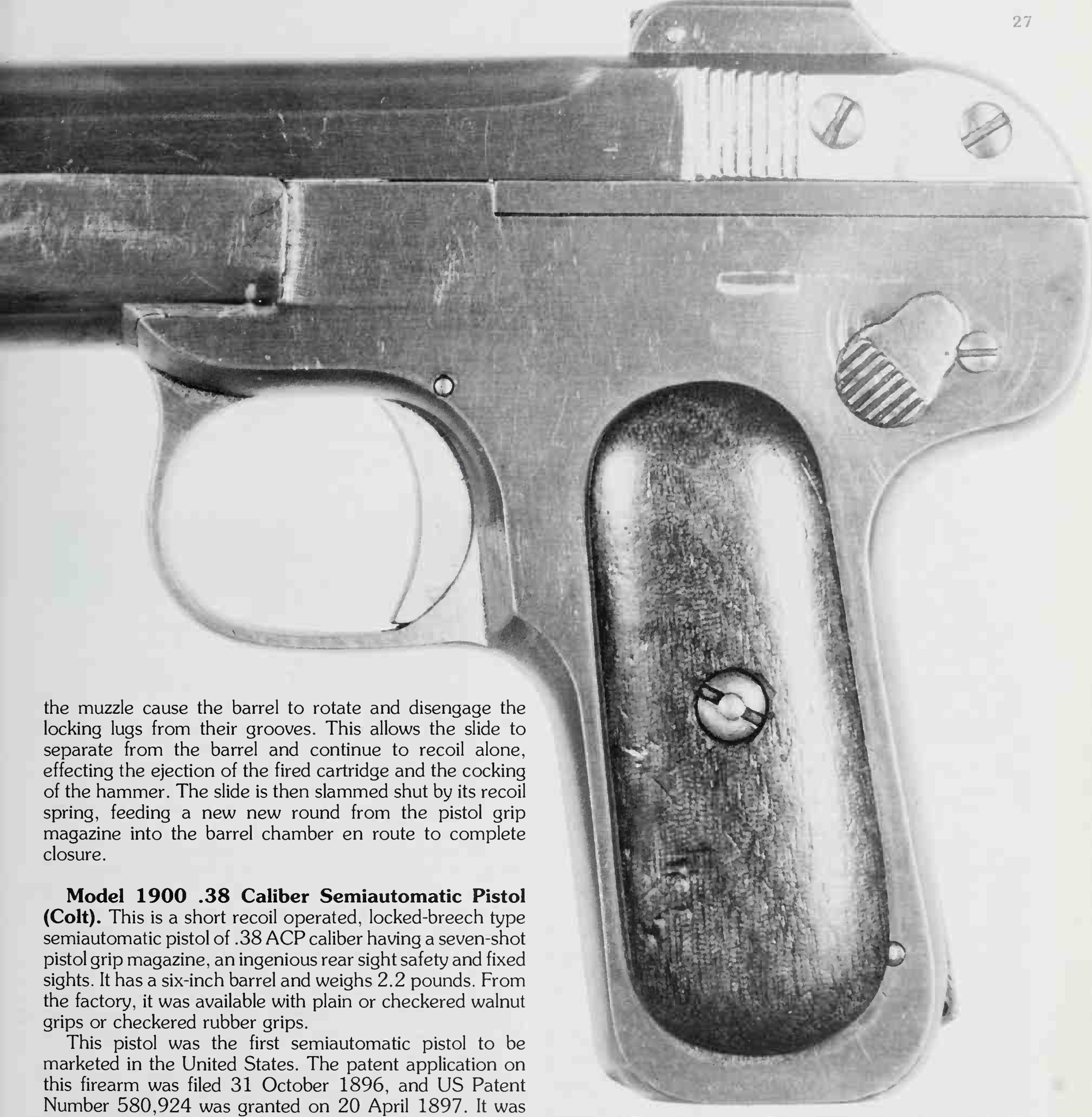
Semiautomatic .38 Caliber Pistol. This is a short recoil operated semiautomatic pistol of .38 caliber, with a pistol-grip magazine, both hammer and grip safety and fixed sights. It has a 5.9-inch barrel, and weighs two pounds. This pistol was the first pistol to employ Browning's famous grip safety. It was invented by John M Browning in 1896. The patent application was filed on 31 October 1896, and US Patent Number 580,925 was granted on 20 April 1897. The firearm was submitted to Colt in the spring of 1896, and American manufacturing and sales rights were granted the company on 24 July 1896. This pistol was never commercially produced.

This semiautomatic pistol employs a rotating barrel which locks to the slide. It consists of a cylinder-shaped frame which contains a cylinder-shaped slide. The barrel, enclosed by the recoil spring, is wholly contained in the slide. Located near the breech end of the barrel are three pairs of locking lugs which fit into corresponding grooves in the slide and lock the barrel and slide together.

When the gun is fired, the barrel and slide recoil together for a short distance. Upon recoil, two camming studs near



.38 Caliber Pistol



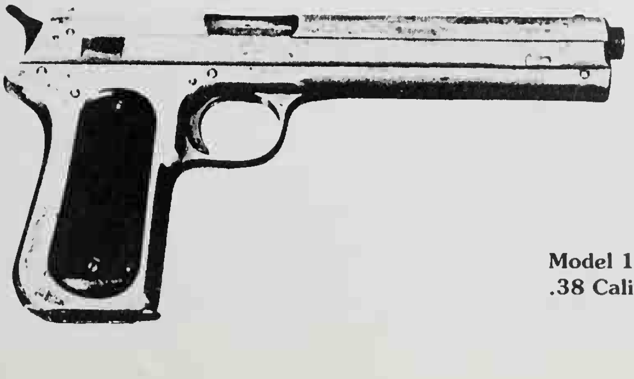
***Above:* The Model 1900 .32 caliber semiautomatic pistol was the first Browning designed automatic pistol ever maufactured. Produced by Fabrique Nationale, it was immediately popular.**

the muzzle cause the barrel to rotate and disengage the locking lugs from their grooves. This allows the slide to separate from the barrel and continue to recoil alone, effecting the ejection of the fired cartridge and the cocking of the hammer. The slide is then slammed shut by its recoil spring, feeding a new new round from the pistol grip magazine into the barrel chamber en route to complete closure.

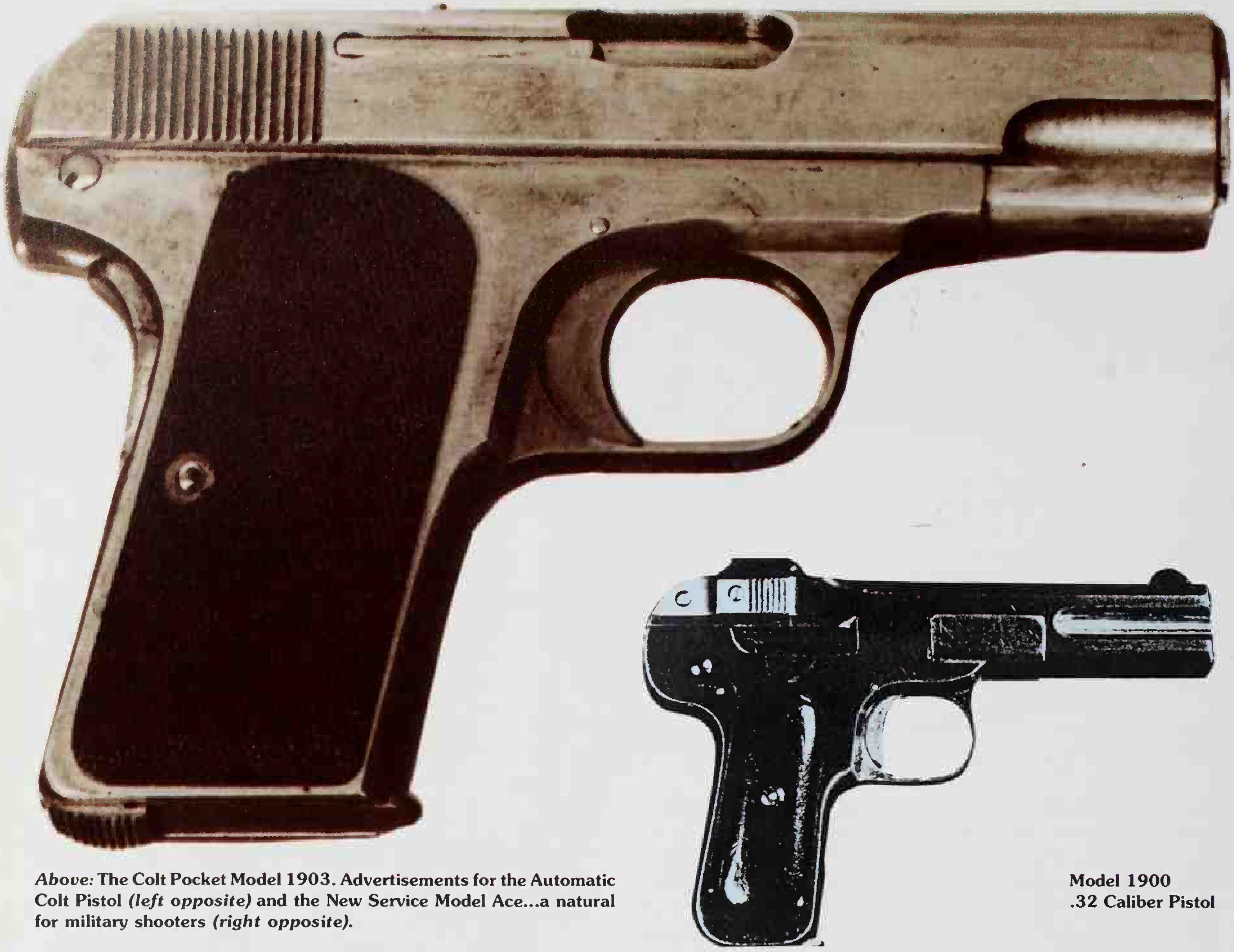
Model 1900 .38 Caliber Semiautomatic Pistol (Colt). This is a short recoil operated, locked-breech type semiautomatic pistol of .38 ACP caliber having a seven-shot pistol grip magazine, an ingenious rear sight safety and fixed sights. It has a six-inch barrel and weighs 2.2 pounds. From the factory, it was available with plain or checkered walnut grips or checkered rubber grips.

This pistol was the first semiautomatic pistol to be marketed in the United States. The patent application on this firearm was filed 31 October 1896, and US Patent Number 580,924 was granted on 20 April 1897. It was tested by Colt on 29 June 1896, selected for production in 1898 and was placed on the market in February 1900. Its rear sight operated as a safety when pushed down—in which case it blocked the firing pin from the hammer.

Two modified versions appeared in 1902. In the 1902 Sporting Model the safety-sight was replaced with an adjustable rear sight, the hammer was changed from spur to stub round, and as a safety feature a shorter firing pin was used; this last feature soon became a Colt standard. In the 1902 Military Model, capacity was increased to eight rounds, a slide stop was added and the pistol grip was made larger.



Model 1900
.38 Caliber Pistol



Above: **The Colt Pocket Model 1903. Advertisements for the Automatic Colt Pistol *(left opposite)* and the New Service Model Ace...a natural for military shooters *(right opposite).***

Model 1900 .32 Caliber Pistol

In 1903 a short-barrel Pocket Model was introduced. The Sporting Models of 1900 and 1902 were discontinued in 1908, the Pocket Model in 1927, and the Military Model in 1928. Total production figures on this pistol are at best approximate. Not only were several numbering systems used for the serial numbers, but large blocks of numbers were set aside for pistols which were—as far as can be determined—never manufactured. Numbering on the military model started at a high figure, then receded, then started back up again. It is estimated that an approximate total of 111,890 of the Sporting, Military and Pocket Models were produced.

Model 1900 .32 Caliber Semiautomatic Pistol (Fabrique Nationale). This is a hammerless, blowback-operated semiautomatic pistol of .32 ACP (7.65mm Browning) caliber, with a seven-shot pistol grip magazine, a thumb safety and fixed sights. It has a four-inch barrel, weighs 1.4 pounds and has factory walnut grips. This was the first Browning-designed semiautomatic pistol to go into production with any firm.

This gun was invented early in 1897. The patent application was filed 28 December 1897, and US Patent Number 621,747 was granted on 21 March 1899. It was shown to Colt officials and a representative of Belgium's Fabrique Nationale shortly after, and on 17 July 1897, a contract between Browning and Fabrique Nationale was signed, authorizing the firm to manufacture the pistol for all markets outside the United States. Actual production commenced in 1899, thus entitling this design to the above stated claim. The FN .32 Caliber Model 1900, as it was listed by Fabrique Nationale, became immediately popular, and demand was exceptional—100,000 had been produced by August 1904, and 500,000 had been produced by 1909. This model was discontinued in 1910 and was replaced by FN Model 1910, after a total production of 724,450 units.

Model 1911 Government .45 Caliber Automatic Pistol (Colt, Remington and Others). This is a short recoil-operated, locked-breech, semiautomatic pistol which has been manufactured in a wide variety of calibers, including .22, .38, .38 Super, .45 ACP and 9mm. In .45 ACP caliber, this firearm has a seven-shot pistol-grip magazine, comes equipped with manual, grip and magazine safeties and has fixed sights. With a standard barrel of five inches (the original was 3.8 inches), weighs 2.4 pounds, and has a wide variety of grip styles, including diamond-checkered walnut, plain checked walnut and Colt plastic.

Invented in 1905, this is one of John M Browning's most famous designs. The original was the pilot model for what has, for over a half century, been the official United States military sidearm. The patent application for the pistol was

Military Model
Semiautomatic
.45 Caliber Pistol

Model 1911
Government Automatic
.45 Caliber Pistol

filed on 17 February 1910, and US Patent Number 984,519 was granted on 14 February 1911. A second patent application—covering the details of the mechanical safety—was filed 23 April 1913 and US Patent Number 1,070,582 was granted 19 August 1913.

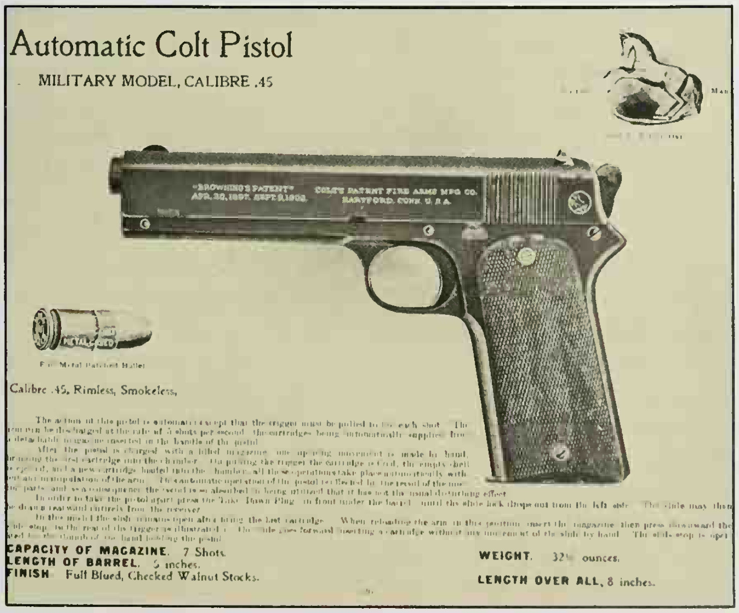
Colt commenced production in late 1905 with the first models reaching the market in the spring of 1906. The model was considered a commercial success and remained on the market in essentially its original design form until 1911, although some slight modifications had been made in 1909 and 1910.

The US government automatic pistol trials in March 1911 brought in a recommendation for adoption. Upon ratification, adoption became official on 29 March 1911, and the first Military Model was manufactured by Colt on 31 December of that year. A commercial model, identical with the Military Model except for markings, appeared on the market on 9 March 1912.

Slight changes in both of these models have been made over the years. The most important was the traditional Browning improvement of redesigning the pistol's parts so that they served several functions, thereby improving an already efficient design by reducing the total number of parts and simplifying the firearm. These changes were covered by a 1913 Browning patent.

In 1929 Colt brought out the Super .38 Model, which was patterned after the .45 Model 1911, but was chambered for the .38 caliber cartridge. In 1931, .22 caliber was added to the design roster, with the .22 Ace Pistol. This was followed by two deluxe-grade models in 1933—the .45 National Match Pistol and the .38 Super Match. The Commander, a lightweight model weighing 1.7 pounds, was made available in 1949. This model was available in .45 ACP, .38 Super and 9mm calibers. In 1957, Colt brought out another deluxe .45 caliber target pistol, the Gold Cup National Match. A counterpart in .38 caliber, the .38 National Match, appeared in 1960.

Although these models cover a wide range of grades, all stick closely to the Model 1911 in basic design specifications. One exception is the .22 Service Ace, introduced in 1937. Based on the Model 1911, it contained modifications by another designer which enabled the shooter to get the same recoil or 'kick' with .22-caliber cartridges as with .45 ACPs,



Automatic Colt Pistol

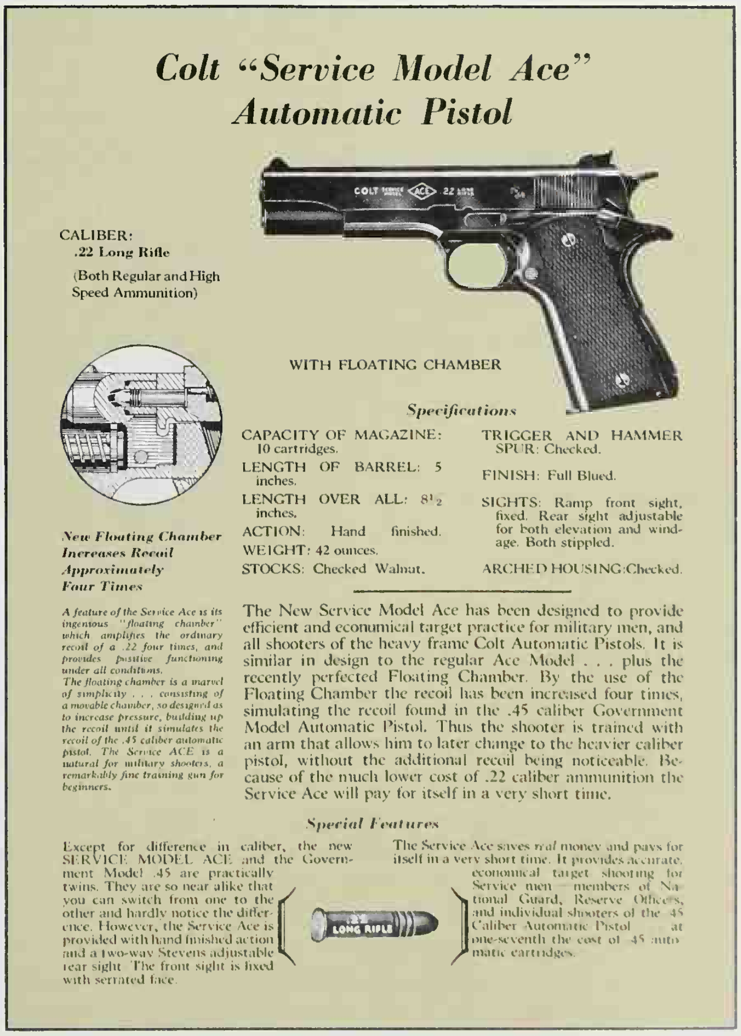
MILITARY MODEL, CALIBRE .45

"BROWNING'S PATENT"
APR. 20, 1897. SEPT. 9, 1902.
COLT'S PATENT FIRE ARMS MFG. CO.
HARTFORD, CONN. U.S.A.
Full Metal Patched Bullet

Calibre .45, Rimless, Smokeless,

CAPACITY OF MAGAZINE. 7 Shots.
LENGTH OF BARREL. 5 inches.
FINISH. Full Blued, Checked Walnut Stocks.

WEIGHT. 32½ ounces.
LENGTH OVER ALL. 8 inches.



Colt "Service Model Ace"
Automatic Pistol

COLT SERVICE MODEL ACE .22 LONG RIFLE
.22 LONG RIFLE

CALIBER:
.22 Long Rifle
(Both Regular and High Speed Ammunition)

WITH FLOATING CHAMBER

New Floating Chamber Increases Recoil Approximately Four Times

A feature of the Service Ace is its ingenious "floating chamber" which amplifies the ordinary recoil of a .22 four times, and provides positive functioning under all conditions.
The floating chamber is a marvel of simplicity . . . consisting of a movable chamber, so designed as to increase pressure, building up the recoil until it simulates the recoil of the .45 caliber automatic pistol. The Service ACE is a natural for military shooters, a remarkably fine training gun for beginners.

Specifications

CAPACITY OF MAGAZINE: 10 cartridges.
LENGTH OF BARREL: 5 inches.
LENGTH OVER ALL: 8½ inches.
ACTION: Hand finished.
WEIGHT: 42 ounces.
STOCKS: Checked Walnut.
TRIGGER AND HAMMER SPUR: Checked.
FINISH: Full Blued.
SIGHTS: Ramp front sight, fixed. Rear sight adjustable for both elevation and windage. Both stippled.
ARCHED HOUSING: Checked.

The New Service Model Ace has been designed to provide efficient and economical target practice for military men, and all shooters of the heavy frame Colt Automatic Pistols. It is similar in design to the regular Ace Model . . . plus the recently perfected Floating Chamber. By the use of the Floating Chamber the recoil has been increased four times, simulating the recoil found in the .45 caliber Government Model Automatic Pistol. Thus the shooter is trained with an arm that allows him to later change to the heavier caliber pistol, without the additional recoil being noticeable. Because of the much lower cost of .22 caliber ammunition the Service Ace will pay for itself in a very short time.

Special Features

Except for difference in caliber, the new SERVICE MODEL ACE and the Government Model .45 are practically twins. They are so near alike that you can switch from one to the other and hardly notice the difference. However, the Service Ace is provided with hand finished action and a two-way Stevens adjustable rear sight. The front sight is fixed with serrated face.

The Service Ace saves *real* money and pays for itself in a very short time. It provides accurate, economical target shooting for Service men — members of National Guard, Reserve Officers, and individual shooters of the .45 Caliber Automatic Pistol at one-seventh the cost of .45 automatic cartridges.

Above: Designed in 1905 and made by Fabrique National, this was the first .25 caliber semiautomatic. An almost identical model was manufactured by Colt.

effecting an economy in combat practice ammunition and paying an indirect compliment to the original inventor at the same time.

Manufacture of the two Ace models was discontinued in 1940, but because the stock of parts for these was so large, Ace pistols were sold until 1947. Altogether, 10,935 units of the Ace and 13,800 units of the Service Ace were manufactured. Likewise, the .45 National Match and the .38 Super Match were discontinued in 1940; but they were still numbered with the regular commercial models for years afterward.

Between 1911 and the beginning of World War I, approximately 100,000 of the official Government Model 1911s were produced for the US Armed Forces. In 1917, the Ordinance Department, in an attempt to step up production, contracted with nine companies to produce the pistol. Of these nine, however, only the Remington Arms Company actually entered production before the war ended. For the duration, Colt produced 488,450 and Remington 21,676 units, for a wartime total of 510,126 pistols overall.

During World War II, an estimated 1,800,000 Government Model 1911s were made. Under a licensing agreement similar to that of World War I, Colt and Ithaca each produced about 400,000 units; Remington-Rand, Inc produced about 900,000 units; and the Union Switch and Signal Company produced about about 50,000 units.

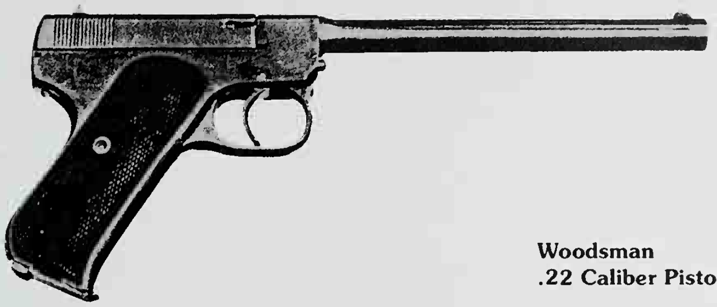
After visiting all the factories which, in peace and war, have produced this weapon and examining their records, martial arms authority Lieutenant Colonel RC Kuhn has determined that, just by the end of 1945, total production of the military model was 2,695,212 units—and production has continued 'for lo, these many years since.'

Model 1910 & 1922 Pistol

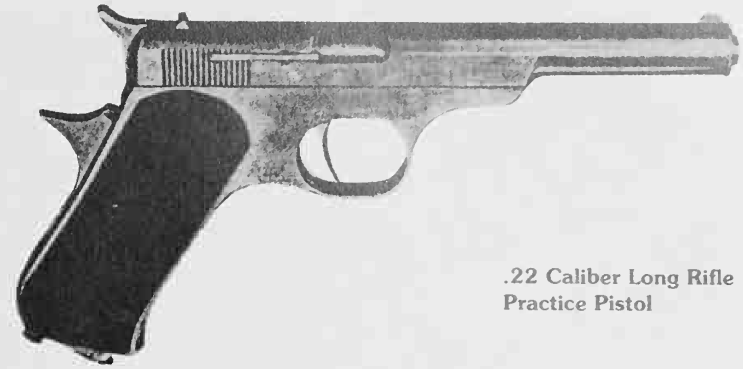
Semiautomatic .25 Caliber Pistol Model Vest Pocket (Fabrique Nationale, Colt, Browning and Others). This is a blowback-operated, hammerless, semiautomatic pistol in .25 ACP caliber, with a six shot pistol-grip magazine, with thumb, grip and (later models) magazine safeties. This pistol has fixed sights, an overall length of 4.5 inches and weighs 13 ounces. Grips on various examples are black rubber with checked field and checked walnut.

This pistol was the first .25 caliber semiautomatic. It was invented by John M Browning in 1905, and was patented in Belgium that same year. This was the only Colt automatic pistol that was truly hammerless—it was discharged by a striker mechanism.

In the United States, patent application on the gun was filed 21 June 1909, and US Patent Number 947,478 was granted on 25 January 1910. The pistol's size partially accounts for (but is by no means proportionate to) its sales. It was first manufactured by FN in 6.35mm in 1905, and approximately 100,000 were sold within the first five years. Colt obtained license to manufacture the pistol in the United



Woodsman
.22 Caliber Pistol



.22 Caliber Long Rifle
Practice Pistol

States and their version, chambered for the .25 caliber ACP cartridge, was introduced in October 1908, with sales numbering 141,000 by 1917. A later Browning Arms Company model, introduced in 1953, also proved highly successful.

The FN and Colt Models are almost identical, except for the thumb safety. The FN safety has a hook which latches into a notch forward of the regular safety notch in the slide and holds the slide to the rear in such a way that the barrel can be easily turned for takedown. The Colt safety has no hook, and has only one notch in the slide which locks the slide when the safety is on. The only other modifications in the Colt model were the addition of a magazine safety in 1917 and a change in sights. The Colt model was discontinued in February 1947, with total production of 420,753 units.

The first FN model was discontinued in 1940, after production of 1,080,408 units. The current Browning and FN Model .25 Caliber followed. In this, the grip safety has been eliminated, and the weight of the pistol has been reduced to 10 ounces in the standard model and 7.8 ounces in the lightweight model; the overall length was reduced to four inches in both. Even before the expiration of Browning's patents, numerous imitations of this gun had appeared on the market, particularly from Spain. Production figures on all models probably number well into the millions.

Woodsman .22 Caliber Semiautomatic Pistol (Colt). This is a blowback-operated, hammerless (concealed hammer), semiautomatic pistol in .22 long rifle caliber (early models, however, handled only low-velocity .22s), with a 10-shot magazine. This pistol has thumb and automatic (breechblock must be fully closed for firing) safeties, fixed rear/bead or partridge-style front sights, and a (after 1933) 4.5 or (pre-1933) 6.5-inch barrel. With the shorter barrel, the Woodsman weighs in at 10 ounces; with the longer barrel, this figure is 1.75 pounds. Grips for all variants tend to be checkered walnut.

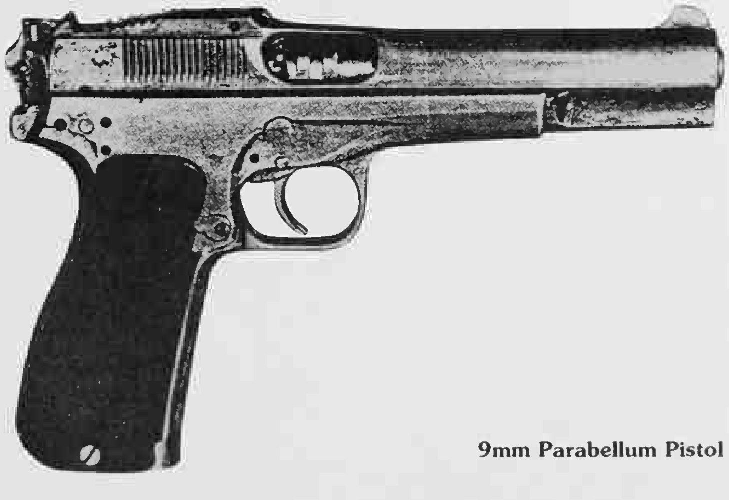
The Woodsman pistol was invented in 1914. The patent application was filed on 30 March 1917 and US Patent Number 1,276,716 was granted on 27 August 1918. Colt began production on 29 March 1915, first calling it the 'Colt .22 Automatic Target Pistol.' Not until 1927 was it given the name by which it is best known, 'the Woodsman.' Somewhat of a rarity for the era in which it first appeared, it utilizes a half-length slide which completely separates from the breech end of the barrel.

'Lesmok or semi-smokeless, lubricated cartridge only' was Colt's caution on ammunition for early models. In approximately 1920, a change in magazine design made possible the use of high-speed ammunition. Many owners converted their models before this. It was relatively easy to make the pistol capable of handling high-velocity cartridges—by replacing the original mainspring, housing and recoil spring, and by employing an upgraded magazine.

The 4.5-inch barrel Sport Model was introduced in 1933, followed by the Match Target Woodsman in 1938. This was a deluxe model of the Target Woodsman, with an extra-heavy 6.5-inch barrel, larger grips, new trigger, new sights, an added seven ounces of weight. It represented a radical change in design, with a flat-sided barrel and elongated, curved grips.

Manufacture of all three models was discontinued in 1940, but as a result of a plentiful supply of already-manufactured parts, these pistols remained on the market until June 1947, with a total production of 187,423 units.

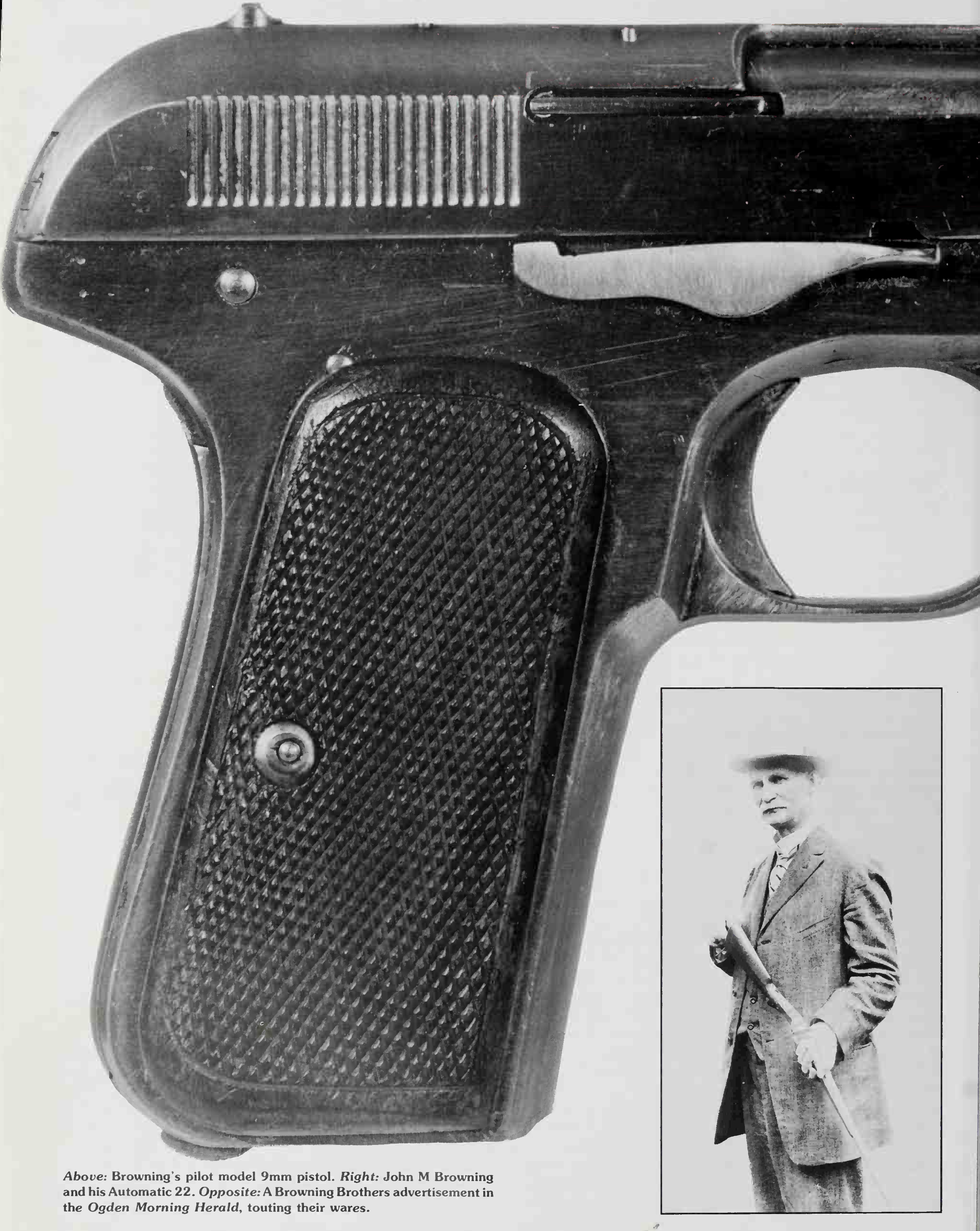
Two postwar Woodsman models with familiar names were introduced in May 1947—the Target, with a six-inch barrel, and the Sport, with a 4.5 inch barrel. In December of the same year, Match Target Pistols, with 4.5 or six-inch barrels, were introduced. In 1950, Colt brought out an economy model based on the Woodsman; this had a 4.5 inch barrel, and modifications—on the sights, magazine and other aspects of the Woodsman design—distinguished this as an economy firearm. First designated the 'Challenger,' it was renamed the 'Huntsman' in 1955. In 1959, Colt made a few minor changes in the Target Model and redesignated it the 'Targetsman.'



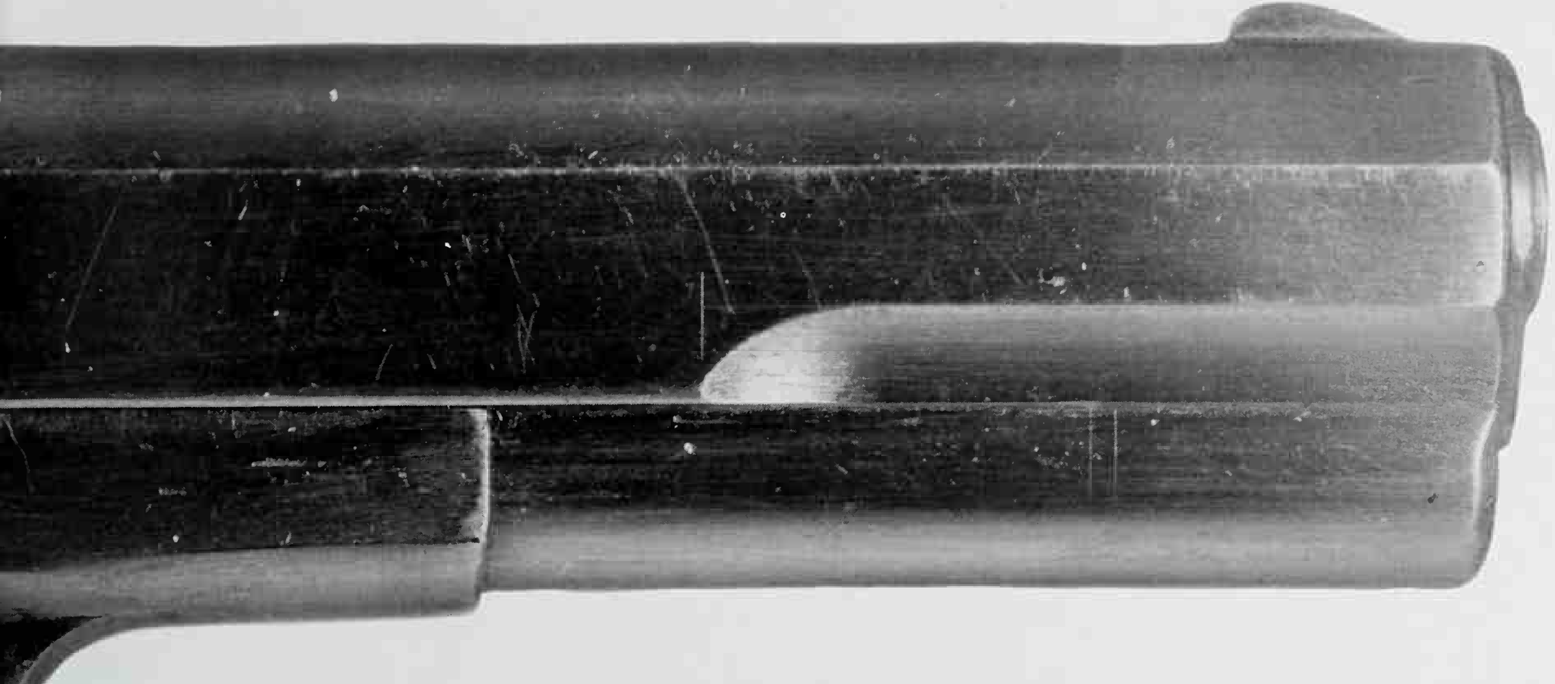
9mm Parabellum Pistol

Semiautomatic Pistol in 9mm Parabellum Caliber. This is a blowback-operated, hammerless (concealed hammer), semiautomatic pistol in 9mm Parabellum caliber, with a pistol-grip magazine, thumb and hammer safeties, and fixed front/elevation rear, sights. It has a 5.7-inch barrel and weighs 2.3 pounds.

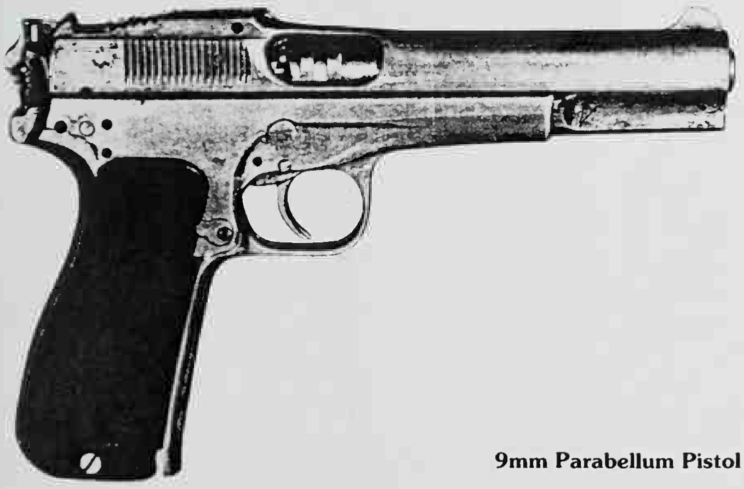
The barrel is adapted to move rearward a short distance in a line parallel with the movement of the breechblock and slide without being locked to the breechblock.



Above: Browning's pilot model 9mm pistol. *Right:* John M Browning and his Automatic 22. *Opposite:* A Browning Brothers advertisement in the *Ogden Morning Herald*, touting their wares.



In early 1923, John M Browning was informed that the French Ministry of War was interested in obtaining a semiautomatic pistol of large magazine capacity chambered for the 9mm Parabellum cartridge. Browning completed this model in a few months. This pistol was never patented or commercially produced. It has been seen as a precursor design to Browning's last pistol design, which closely resembled it.



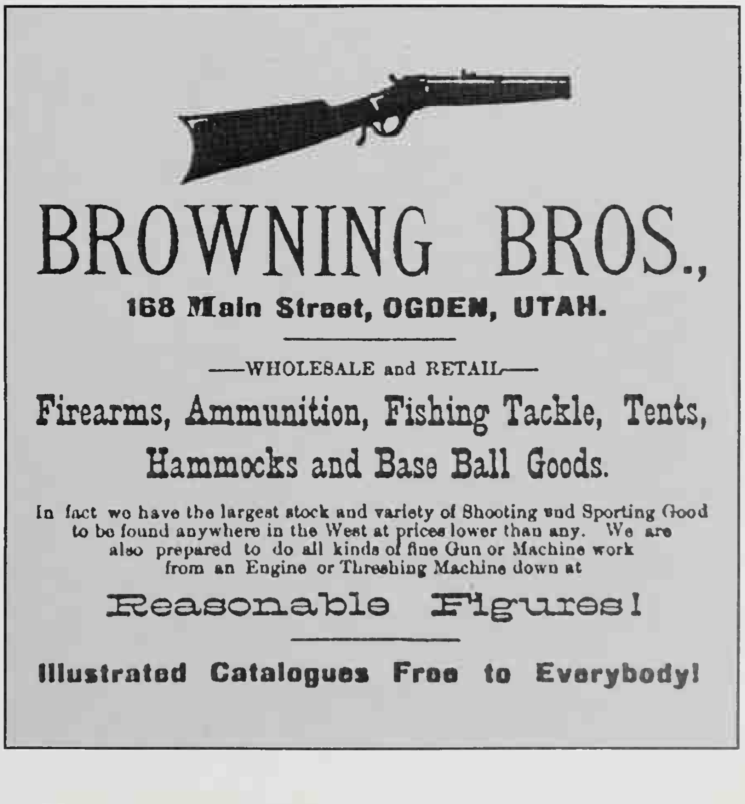
9mm Parabellum Pistol

Semiautomatic Pistol in 9mm Parabellum Caliber (Fabrique Nationale, Browning and Others). This is a short recoil-operated, locked breech, semiautomatic pistol in 9mm Parabellum (9mm Luger) Caliber, with a 13-shot pistol-grip magazine and blade front/fixed rear sights (some military models having graduated-leaf rear sights). This pistol has thumb, hammer and magazine safeties, a 4.6-inch barrel and weighs 2.2 pounds. The grips are checkered wood; military models are also equipped with a quick-takedown shoulder stock which is fastened to the grips so that the pistol can be fired with rifle-like steadiness.

This was John M Browning's last pistol development. The patent application was filed on 28 June 1923, and US Patent Number 1,618,510 was granted on 22 February 1927—three months after John M Browning's death.

This was first produced by Fabrique Nationale in 1935 as the 'Model 1935.' The visible ribs on the breech end of the barrel are engaged by corresponding grooves in the slide which securely lock the two together upon firing. The breechblock is demountably fixed to the slide, so that the breechblock effectively seals the breech against the force of the fired charge. Recoil continues in this locked position until the bullet leaves the bore. Then a camming action tilts the rear of the barrel downward, freeing the slide and the breechblock to continue rearward, effecting the necessary ejection and cocking operations. A spring slams the action shut anew, and as this operation proceeds, a fresh cartridge is shoved from the magazine into the firing chamber by lugs on the moving mechanism.

The Model 1935 was adopted as the official sidearm of the Belgian Army and other European and colonial troops. Over 200,000 were manufactured in Canada for the Chinese Army during World War II. This pistol was, for years, the standard military sidearm of many of the NATO countries, and the Browning Company sold it as a personal and sporting arm as well.



BROWNING BROS.,

168 Main Street, OGDEN, UTAH.

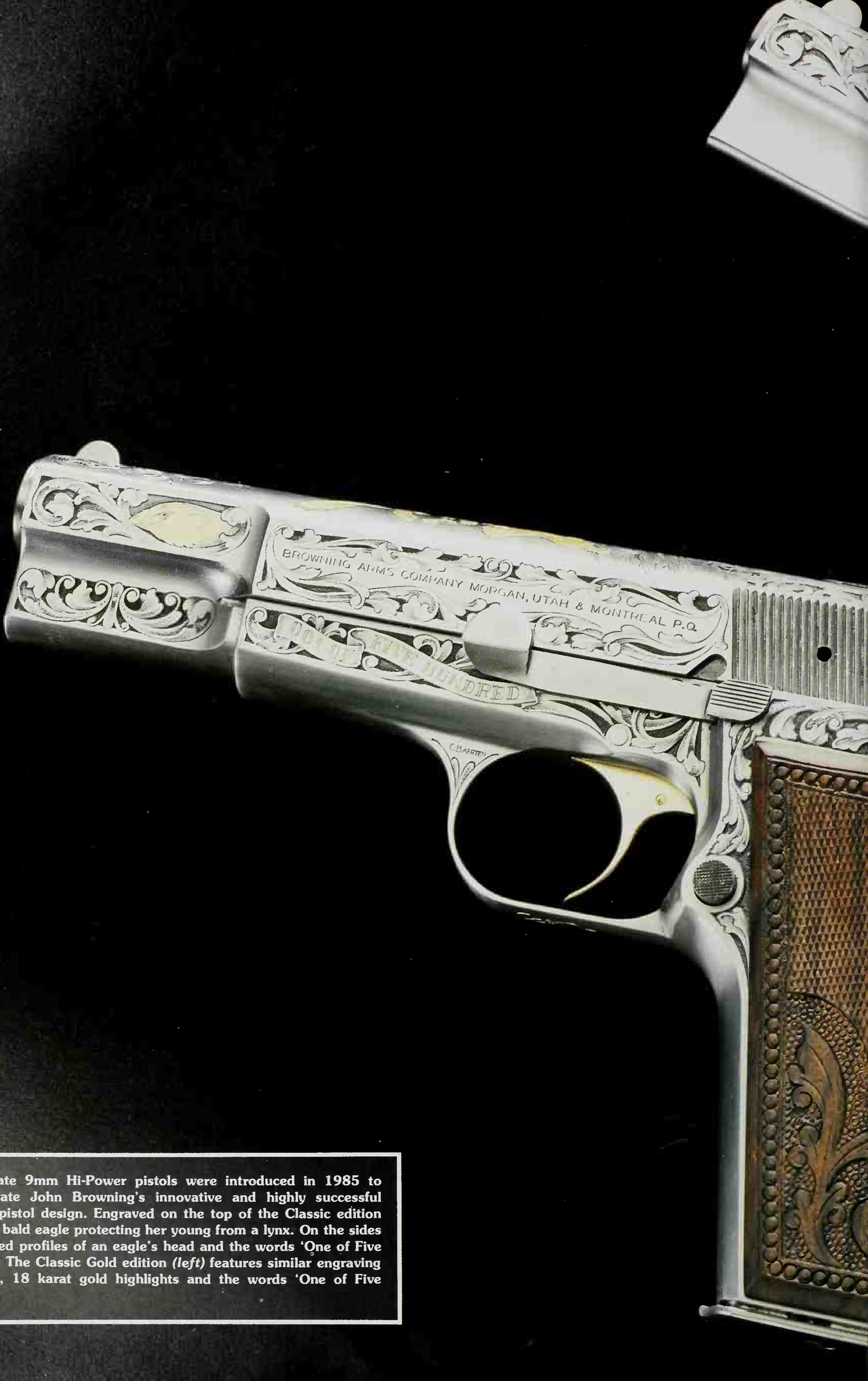
—WHOLESALE and RETAIL—

Firearms, Ammunition, Fishing Tackle, Tents, Hammocks and Base Ball Goods.

In fact we have the largest stock and variety of Shooting and Sporting Good to be found anywhere in the West at prices lower than any. We are also prepared to do all kinds of fine Gun or Machine work from an Engine or Threshing Machine down at

Reasonable Figures!

Illustrated Catalogues Free to Everybody!


BROWNING ARMS COMPANY MORGAN, UTAH & MONTREAL P.Q.
ONE OF FIVE HUNDRED
C.BAERTEN

These ornate 9mm Hi-Power pistols were introduced in 1985 to commemorate John Browning's innovative and highly successful automatic pistol design. Engraved on the top of the Classic edition *(right)* is a bald eagle protecting her young from a lynx. On the sides are engraved profiles of an eagle's head and the words 'One of Five Thousand.' The Classic Gold edition *(left)* features similar engraving with inlaid, 18 karat gold highlights and the words 'One of Five Hundred.'

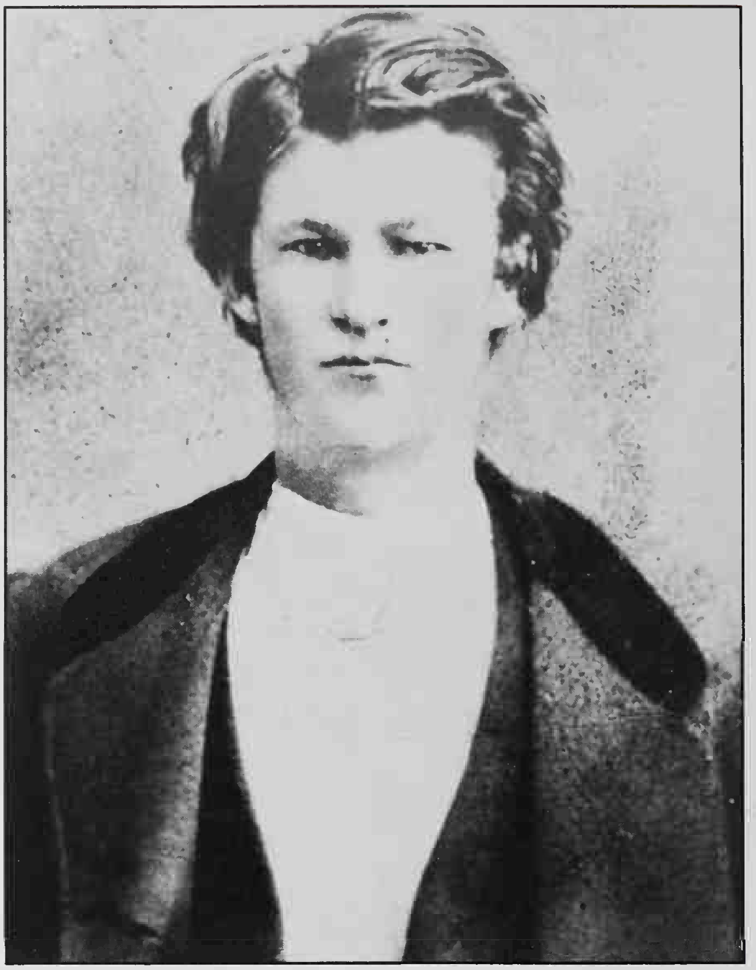
BROWNING ARMS COMPANY MORGAN, UTAH & MONTREAL P.Q.
ONE OF FIVE THOUSAND

A Selection of John M Browning's Rifles

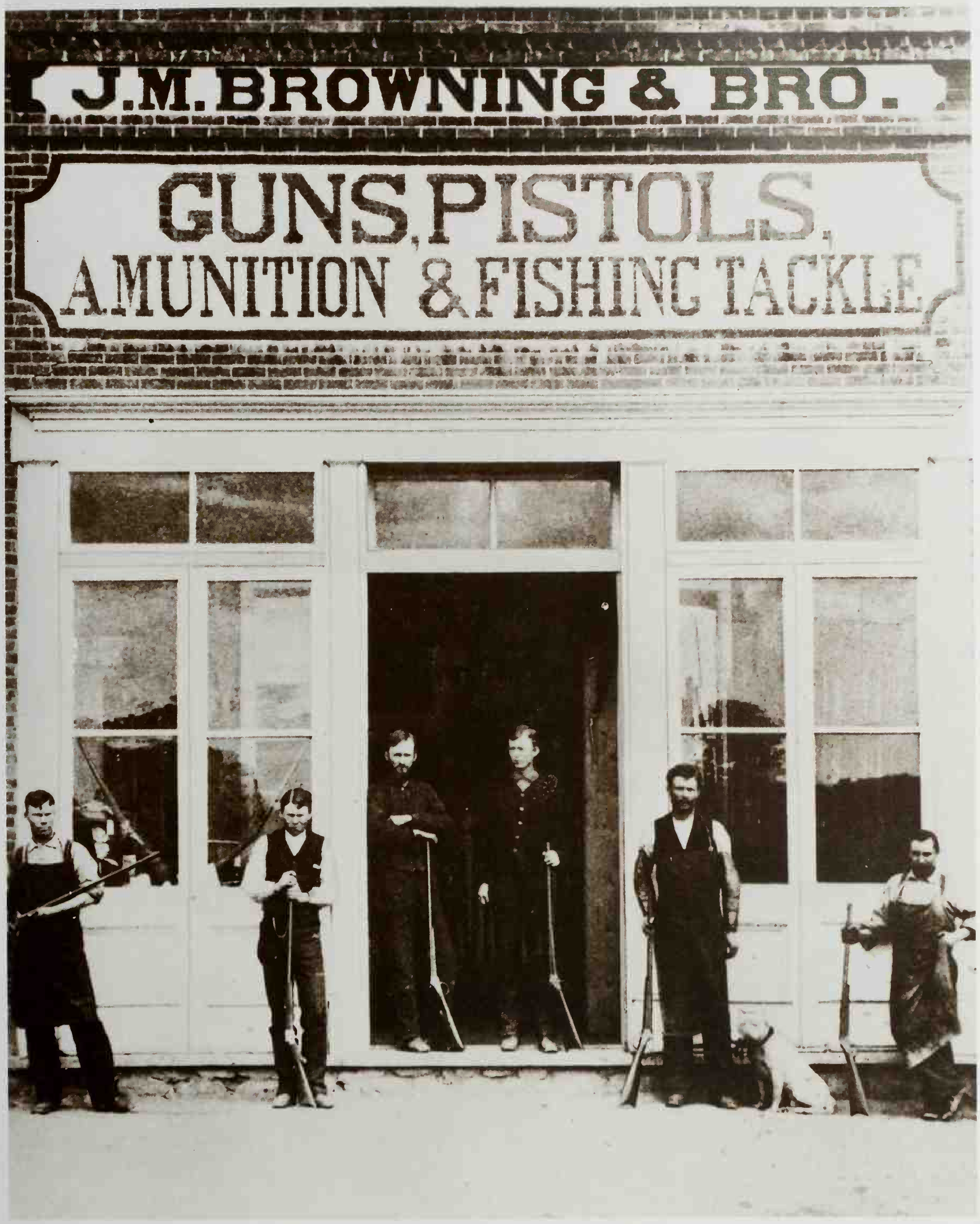
Single Shot Rifle (Browning Brothers and Winchester). This is a single shot falling block rifle which has been adapted to a very wide variety of calibers, ranging from .22 short to .50-90 Sharps. It has both hammer and action safeties (half-cock notch and full-close firing only), windage and elevation-adjustable rear/blade front sights, a variety of barrel lengths from 15 to 30 inches (depending upon model) and, likewise, weight varying from 4.5 to 13 pounds. Since this rifle was made in a wide number of variants, stock styles varied widely also, from a standard rifle type stock to the ornate and heavily styled Schuetzen target model, to the shotgun style featured on that particular variant! Barrels likewise varied—in length, as is noted above, and in configurations from round to octagonal to half-octagonal.

This was John M Browning's first firearm, invented in 1878 when he was 23 years old.The patent was filed 12 May 1879, and US Patent Number 220,271 was granted on 7 October 1879. Production by the Browning Brothers, in Ogden, Utah Territory, began about 1880 and continued until 1883, with a total of approximately 600 rifles manufactured. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1883 and the rifle appeared in 1885 as the Winchester Single Shot Model 1885.

The hammer dropped down with the breechblock when the trigger guard was levered open, and cocking was accomplished by the closing movement. Of course, it could also be cocked by hand.



GUNSMITH
WILL MANUFACTURE TO ORDER REVOLVING RIFLES & PISTOLS ALSO SLIDE GUNS FROM 5 TO 25 SHOOTERS
BLACKSMITH & FARRIER


J.M. BROWNING & BRO.
GUNS, PISTOLS,
AMUNITION & FISHING TACKLE

Above left: The inventor at age 18. *Opposite:* The Browning shop and factory as it appears today, and *(above)* as it appeared in 1882. Shown here from left to right are Sam Browning, George Browning, John M Browning, Matthew S Browning, Ed Browning and Frank Rushton.

Overleaf: The Browning tradition of innovation and craftsmanship continues today—*(from the top down)* an A-Bolt 22 Bolt Action, a BL-22 Lever Action Grade II, a BL-22 Lever Action Grade I and a 22 Semi-Auto.

House
Stewart Edward White
YESTERDAYS
WRIGHT
A.L. BURT COMPANY
KEEP THE WAGONS MOVING!
THE RE-CREATION OF BRIAN KENT
WRIGHT
THE BOOK SUPPLY COMPANY
of the TRAIL
JOHNSON
THEIR YESTERDAYS
WRIGHT
THE SPOILERS
REX BEACH
THE STRANGE TEEPEE
HART
The Prairie Mother
THE BOOK SUPPLY COMPANY
H.W. RODEN
NIVEN BUSCH
GRACE HARLOWE OVERLAND SERIES
TRIANGLE BOOKS
WAR ON THE RANGE
RUBEL
PHOENIX
THE SILENT CALL
THE SUNSET TRAIL
REX BEACH
REX BEACH
YUKON EDITION
THE NIGHT RIDERS

THE LONE STAR RANGER
ZANE GREY
BAD MEN AND GOOD
EVERY MAN
Winning the Wilderness
McCarter
CYCLONE JIM
REED
THE COVERED WAGON
HOUGH
FACE WEST
HILL
HARPERS
THROUGH THE WALL
MOFFETT
THE IRON HORSE
EDWIN C. HILL
GROSSET & DUNLAP
THE BARRIER
REX BEACH
The Dark Road
LEROUX
ACROSS THE MESA
THE RE-CREATION OF
PETER B. KYNE
STEWART EDWARD WHITE
WRIGHT
MACHARG BALMER
NICHOLS
MARGARET HILL McCARTER
WOLFVILLE
LEWIS
THE BOOK SUPPLY COMPANY
GOLDSMITH
APPLETON
813 K99w Copy 2

Above: **An original 1886 Winchester.** ***At bottom:*** **A replica of same that was introduced in 1986 to commemorate the 100th anniversary of its invention.** ***Opposite:*** **The Model 1886 with half magazine.** ***Right:*** **The Four Bs, Utah's premier live-bird team in the 1890s.**

The Single Shot has been adapted to over 33 different calibers, including both rim- and centerfire cartridges—more than any other single shot or repeating rifle known. It was the first Winchester rifle capable of handling the more powerful metallic cartridges of the period.

Through the years the Single Shot was produced in a variety of models. The light carbine (called the 'Baby Carbine') appeared in 1898. The takedown model was introduced in 1910. A special military target version was introduced in 1905; in 1914 it was revamped as the Winder Musket, named in honor of Colonel CB Winder, and was used for training expeditions in World War I. In 1914, the Single Shot was also made into a shotgun, chambered for the three-inch 20-gauge shell.

This firearm was discontinued in all models in 1920. Total production of all models was approximately 140,325, which includes the 600-unit production by the Browning Brothers.

Tubular Magazine Repeating Rifle. This was a bolt action, tubular magazine firearm of indeterminate caliber. The second arm invented by John M Browning was a tubular magazine repeating rifle. Patent was filed 29 March 1882, and US Patent No. 261,667 was granted 25 July 1882. This gun was never manufactured, and no known models survive.

This was probably John M Browning's first tubular magazine design. From the patent application, its bolt action was to have a rotating sleeve with locking shoulders in the receiver. The then-features of this gun were the arrangement of the tubular magazine under the barrel; the receiver, open at the top; and the carrier for elevating cartridges from the magazine to the chamber.

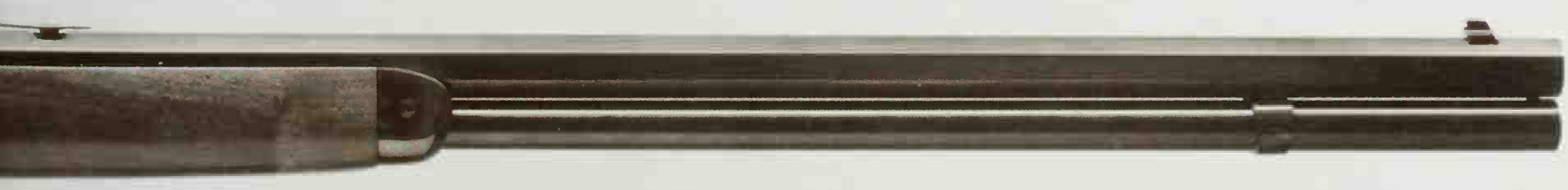
Cartridges are loaded into the magazine through the top of the receiver when the bolt is open. A system of grooves on each side of the inner walls of the receiver guide the cartridges as they are manually forced one by one into the rear opening of the magazine. A spring system in the magazine forces a fresh cartridge onto the spring-loaded carrier at the bottom of the chamber, where, when the bolt is opened, the cartridge is snagged by a lug on the bolt and is thereby slid into the breech when the bolt was closed.

The striker-type firing pin has a finger hook for manual cocking. A spent cartridge is ejected by opening the bolt, which action also allows a fresh cartridge from the magazine to come into position for bolt-loading into the breech.

Lever Action Repeating Rifle. This is a lever action rifle in .45 caliber, with a tubular magazine, an automatic safety and a 26.8-inch octagonal barrel. This rifle weighs 8.8 pounds. It was invented in 1882. Patent was filed 13 September 1882, and US Patent Number 282,839 was granted 7 August 1883. It was never manufactured.

It is a unique firearm in that it operates quite differently from most lever actions. Of very simple construction, the breechblock and finger lever are essentially of one piece. The breech piece is hung to the receiver by the extractor in such a manner that the operating movement causes the rear end of the breech to drop, thereby unlocking the piece, while the forward end, in the receiver, is guided longitudinally by the extractor.

The swinging movement of the combination breechblock and finger piece extracts and ejects the fired shell, and pivots a one-piece carrier upward from the magazine, with a fresh round ready to load when the action is closed. Cocking the hammer is not done automatically, but instead must be done



manually for each round, thus constituting an automatic safety.

When in closed position, the rear end of the breech rests squarely against the recoil-bearing surface in the receiver, holding the front end of the breechblock against the barrel. The purpose of this construction is to provide a lever action rifle of extreme simplicity, with a minimum of parts.

Model 1886 Lever Action Repeating Rifle. This is a lever action repeating rifle in a large variety of calibers—including .45-70 US Government, .40-82 WCF, .45-90 WCF, .40-65 WCF, .38-56 WCF, .50-110, .40-70 WCF, .38-70 WCF, .50-100-450 and .33 WCF—with a choice of either full-length or half-length tubular magazine of varying capacities, depending on the ammunition used. Safeties on this firearm are manual and mechanical, and barrels include 26-inch round, octagon or half octagon, 22-inch round and special barrels and magazines that were finished to owner specifications until 1908. The weight of this arm varies widely depending on specifications and caliber, and stock types range from the sporter with straight or pistol grip, to extra-lightweight, to shotgun, carbine and musket-type stocks.

Invented in 1882–83, this was the first Browning-designed repeating rifle ever manufactured. It was also the first repeating rifle from any source to successfully employ sliding vertical locking lugs—which effectively seal the breech and barrel of the gun. By this same distinction, it was the forerunner of all later Browning lever action rifles. It has been said that practically every improvement since made in lever action rifle design was derived from this design.

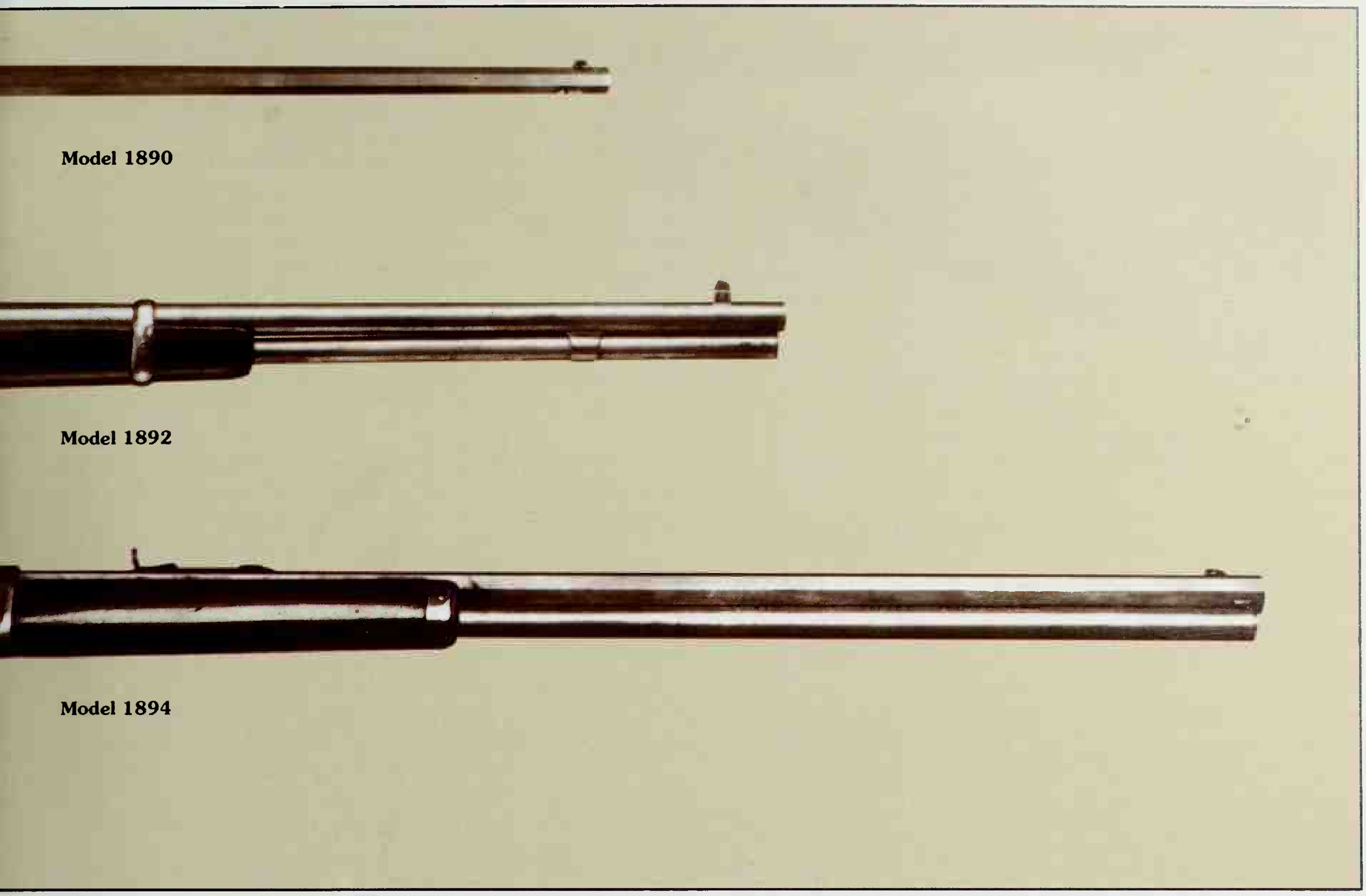
Patent was filed 26 May 1884, and US Patent Number 306,577 was on granted 14 October 1884. Purchased by Winchester in October 1884, it appeared on the market in 1886 as the legendary Winchester Model 1886. In 1894, the Model 1886 was converted to a takedown model, and in 1936, it was slightly modified to handle the .348 Winchester cartridge, and became the Model 71.

The Model 1886 was discontinued in 1935 with 159,994 produced, and the Model 71 was discontinued in 1957 with 43,267 produced. The total production for this rifle was 203,261 units, and its production life had spanned 71 years.

Model 1890 .22 Caliber Pump Action Repeating Rifle (Winchester). This is pump action repeating rifle of .22 caliber (short, long, long rifle and WRF) with a tubular magazine of varying capacity (from 15 shorts to 11 long rifles), manual and mechanical safeties and a wide variety of sights. It has a 24-inch octagonal barrel and weighs, depending on stock styling, 5.8 to 6.0 pounds. Available stocks include a standard rifle type, with curved steel butt plate and straight grip, and optional pistol-grip stocks.

The patent application on this gun was filed 13 December 1887, and US Patent Number 385,238 was granted on 26 June 1888. The firearm was produced, and appeared in 1890 as the Winchester .22 Caliber Repeating Rifle Model 1890, and was the first repeating pump action gun manufactured by Winchester. It has been called 'the most popular .22 caliber pump action rifle ever made.'

What distinguished this rifle over previous .22 caliber repeaters was the cartridge carrier-feed mechanism. Pre-



viously, no positive method of handling the .22 caliber short cartridge had been developed. This small cartridge was prone to jam most repeater rifle mechanisms—it was so short that, often, two cartridges would find their way to where only one of them should have been.

Browning's design features a fingerlike cartridge stop on the front of the carrier, which assures that only one .22 short cartridge at a time can fit onto the carrier. When a spent cartridge is ejected from the chamber, the carrier presents the fresh cartridge, ready to be loaded by the mechanism into the chamber.

First manufactured with its barrel permanently mounted to its frame, the Model 1890 was converted to takedown in 1893. The Model '06, introduced in 1906, represents a modification which enabled one rifle to accept all .22-caliber cartridges except the slightly irregular .22 WRF (the Model 1890 versions were not interchangeable). Also, with these changes, a 20-inch round barrel replaced the 24-inch octagonal barrel. In 1932, the Models 90 and '06 were renamed the 'Model 62,' with the introduction on both of a barrel with slightly different specifications, and new sights.

The Models 90 and '06 were discontinued in 1932 with 849,000 and 848,000 produced respectively. The Model 62 was discontinued in 1958 with 409,475 produced. The production total for all variants of this rifle are 2,106,475 units, with a production life of 69 years.

Model 1892 Lever Action Repeating Rifle (Winchester). The Model 1892 is a lever action repeating rifle of either .44-40, .38-40, .32-20 or .25-20 caliber, with a tubular magazine having capacities ranging from five to 17 rounds, both mechanical and manual safeties, and adjustable sights. With barrel lengths ranging from an absolute minimum of 14 inches (special model) to an absolute maximum of 36 inches (special model), the weight of this firearm varied from 5.5 to eight pounds. The Model 1892 was available with a wide variety of stocks.

The 1892 was originally designed with its barrel permanently mounted to its frame, but in 1893 it became available in a takedown model. A modified version with a decreased magazine capacity was introduced in 1924 as the Model 53. Its successor, the Model 65, was introduced in 1933.

The Model 53 was discontinued in 1932 with a production total of 24,916 units; the Model 65 was discontinued in 1947, with a total of 5704; and the Model 92, though not produced except in the carbine model for several years after the introduction of the Model 53, was not officially discontinued until 1941—at which time 1,004,067 had been manufactured. The manufacturing total for all variants combined stands at 1,034,687 units.

Model 1894 Lever Action Repeating Rifle (Winchester). This is a lever action rifle in .32-40 and .38-55 (both black powder), and .25-35, .30-30 and .32 Special (all three, smokeless powder) calibers, with a tubular magazine of various capacities ranging from three to eight cartridges. This design has both manual and mechanical safeties, and adjustable sights. Barrel lengths and styles include 20-inch round, 22-inch round and 26-inch round, octagonal or half octagonal, and weights range from 5.8 to 6.3 pounds for carbine models, from seven to 7.8 pounds for other variants. Stock styles are many and various.

Often called 'the most famous sporting rifle ever produced,' the Model 94 is perhaps best-known as the 'Winchester .30-30.' Patent was filed 19 January 1894, and US Patent Number 524,702 was granted on 21 August 1894, and the Model 1894 was first manufactured by Winchester in 1894—hence, its company monicker. It was revolutionary in that it was the first repeating hunting rifle to handle the smokeless-powder cartridges.

First manufactured with a permanently attached barrel, it became available in a takedown model in 1895. Modified versions include the Model 55, introduced in 1924 (principal differences being a shorter barrel, a redesigned stock and a switch to half-length magazine), and the Model 64, introduced in 1933 (the main difference being in the type of steel used). The Model 55 was discontinued in 1932, and production for the Model 64 halted in 1957.

Still in production as the Model 94 carbine, this rifle has outsold any other manufactured by the Winchester Repeating Arms Company.

Model 1895 Lever Action Repeating Rifle (Winchester). This is a lever action repeating rifle in a variety of calibers, including .30 US Army, .30-40 Krag, .38-72, .40-72 Winchester, .303 British, .35 Winchester, .405 Winchester, .30 Government 1903, .30 Government 1906 and 7.62mm Russian. This firearm has a four to six round box magazine, adjustable sights and both manual and mechanical safeties. Barrel lengths and styles vary from 22 to 36 inches, and round, octagonal or half-octagonal. Weight and stock style varies according to variant specifications.

This was the first non-detachable box-type magazine rifle designed to handle jacketed sharp-nosed bullets. The patent application for this rifle was filed on 19 November 1894, and US Patent Number 549,345 was granted on 5 November 1895. The firearm was first manufactured by Winchester in 1896, and is known as the Winchester Model 95.

Four slightly different versions of the musket appeared between 1895 and 1908—they are as follows. The .30 Army Model/1895 US Army Pattern was adopted by the US Army in 1895. The same year, some 10,000 of these were chambered for the .30-40 Krag cartridge and were purchased by the US Army for use in the Spanish-American War. Prior to America's entry into World War I, 293,816 of these guns were chambered for the 7.62mm Russian cartridge, and were sold to Russia. The fourth of these particular variants was a takedown version that appeared in 1910.

All models were discontinued in 1931, with a total production of 425,881.

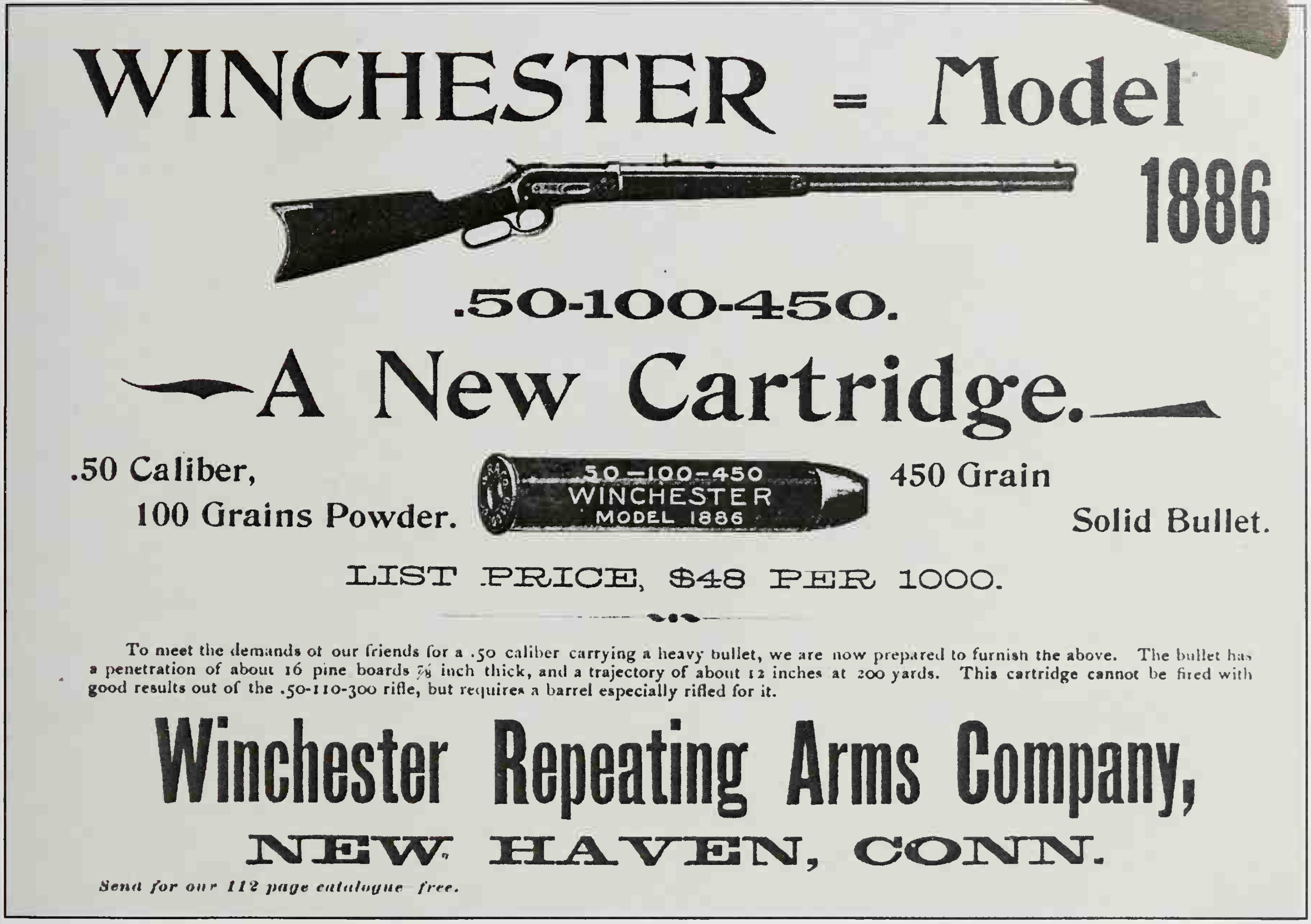
Model 1900 Bolt Action Single Shot .22 Caliber Rifle (Winchester). This was a bolt action, single shot rifle of .22 (long and short, interchangeable) caliber with a manual safety, adjustable sights and an 18-inch round barrel. This rifle weighs 2.8 pounds.

The patent application on this gun was filed 17 February 1899, and US Patent Number 632,094 was granted 29 August 1899. It was first listed in the Winchester 1899 catalogue as the Winchester Model 1900 Single Shot Rifle. Designed as a low price, single shot 'plinking' rifle, it was of especially simple construction and has been widely copied.

The Model 1900 was discontinued in 1902; the Model 1902, announced the same year, had a modified trigger guard shape, a short trigger pull, a steel butt plate, a rear peep sight and a slightly heavier barrel. In July of 1904, another slightly modified version appeared. This was the Model 1904, which had a longer, heavier barrel and a modified stock. Another interesting variant is the Model 99 Thumb Trigger Rifle, which also appeared in 1904. This rifle has no conventional trigger; just behind the cocking piece on the bolt is a button called the 'thumb trigger.' When ready to discharge a round, the marksman merely presses down on this button with the thumb to release the firing pin.

In 1928 and the years following, Winchester brought out other variations—the Models 58, 59, 60 and 68. In 1920, a shotgun version, similar to the Model 1902, was announced—this being the Winchester Model 36 Single Shot Shotgun. It was the only American-made shotgun chambered for 9mm paper shells, and was discontinued in

Above: An original Model 95 Lever Action Takedown Rifle. _Below:_ An original Browning Single Shot, introduced as the Winchester Model 1900. _Right:_ An advertisement for the .50-100-450 cartridge, designed especially for the Winchester Model 1886.



WINCHESTER = Model 1886

.50-100-450.

A New Cartridge.

.50 Caliber,
100 Grains Powder.

50-100-450
WINCHESTER
MODEL 1886

450 Grain
Solid Bullet.

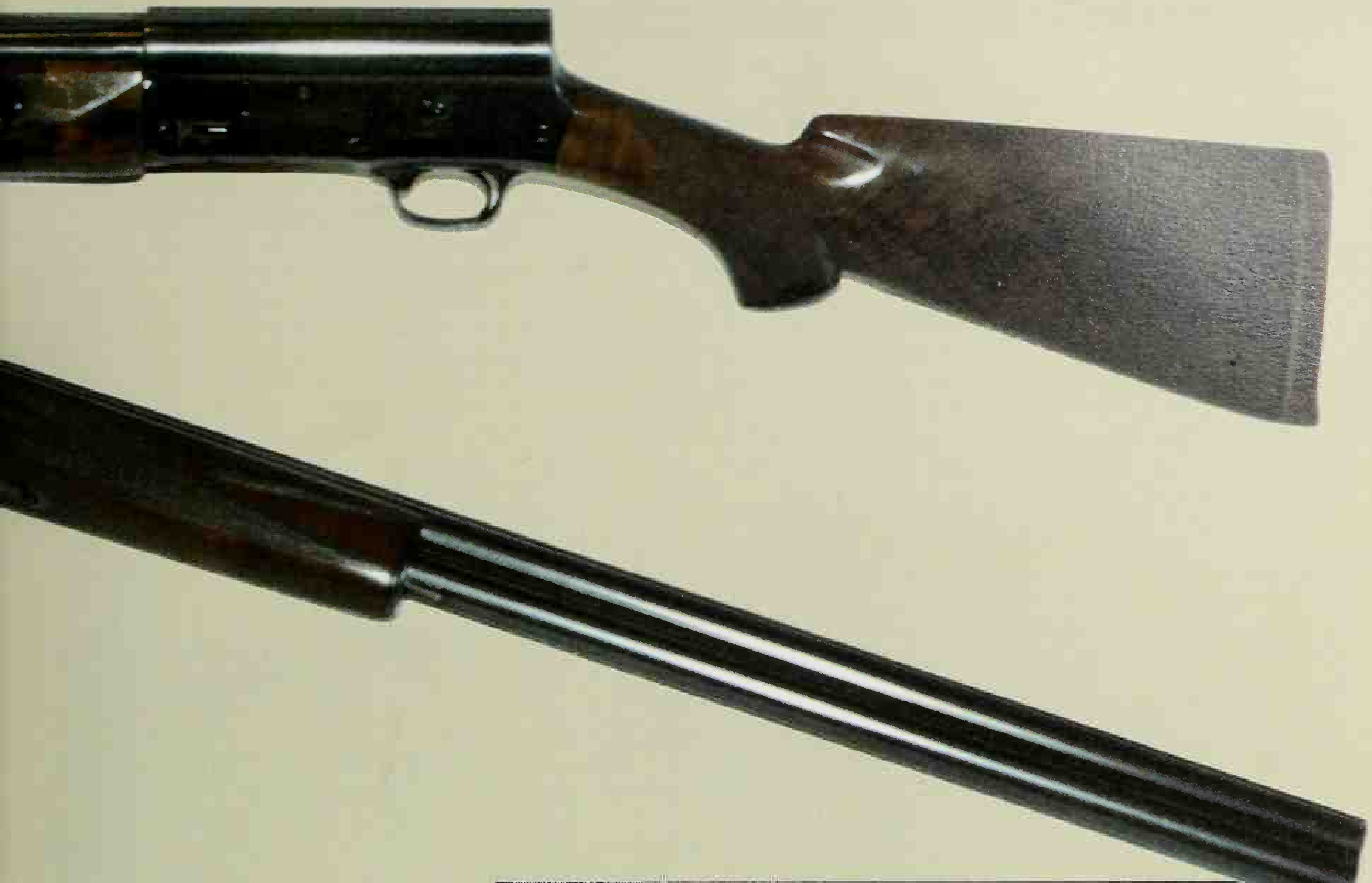
LIST PRICE, $48 PER 1000.

To meet the demands of our friends for a .50 caliber carrying a heavy bullet, we are now prepared to furnish the above. The bullet has a penetration of about 16 pine boards ⅞ inch thick, and a trajectory of about 12 inches at 200 yards. This cartridge cannot be fired with good results out of the .50-110-300 rifle, but requires a barrel especially rifled for it.

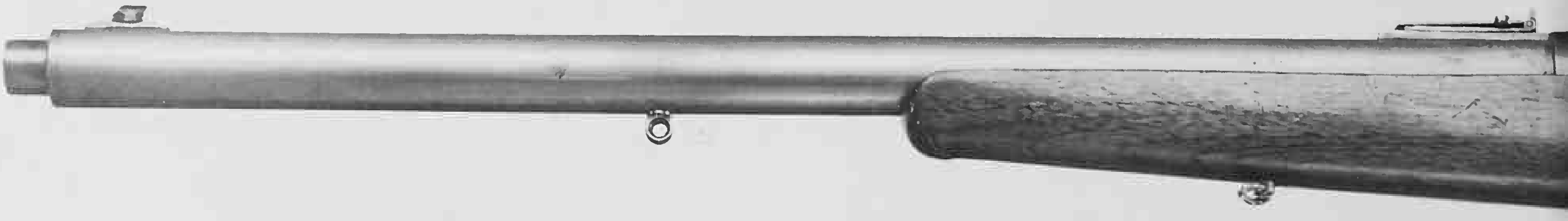
Winchester Repeating Arms Company,

NEW HAVEN, CONN.

Send for our 112 page catalogue free.



These two Browning guns were purchased by Mr OE Brownsey, a good friend of Val Browning. *Above:* An over and under with solid field rib, ivory sight and single selective trigger. *At top:* This automatic has a semi-beaver tail fore end of burled walnut with fine checkering, a solid field rib with ivory sight and a walnut butt stock with matching checker pattern. *At left* holding the automatic is Everett L Brownsey, OE Brownsey's son. Everett Brownsey served as mayor of Tombstone, Arizona. *Right:* From an earlier era, a group of Dodge City gunfighters who relied on their Browning designed Winchesters to enforce the law in Tombstone in the days of the Wild West.



1927. The last variant, the 68, was introduced in 1934 and was discontinued in 1946. The overall production total, including every variant, stands at 1,458,666.

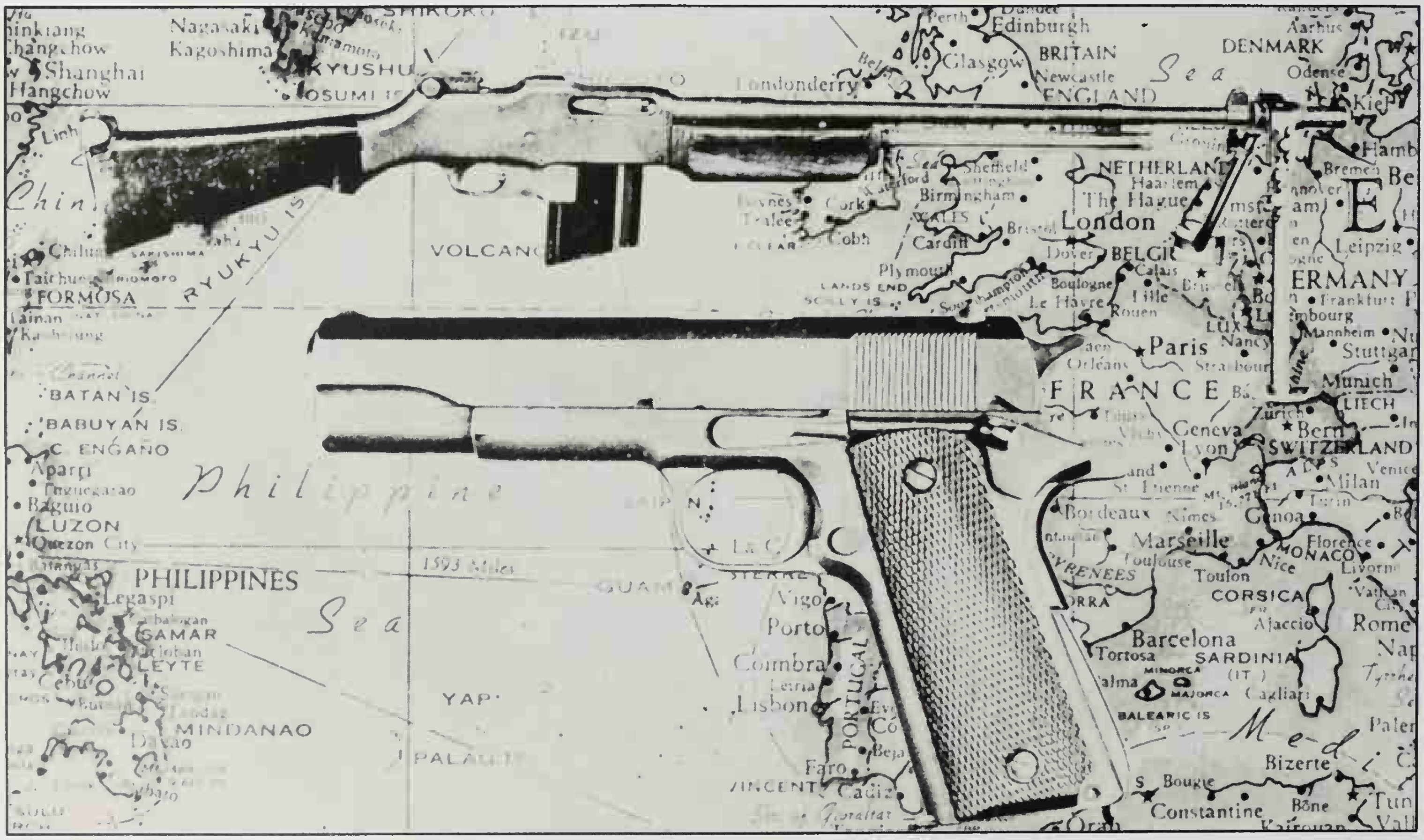
Semiautomatic High Power Rifle (Remington and Fabrique Nationale). This is a recoil-actuated, autoloading rifle in .25, .30, .32 or .35 Remington caliber, with a five-round nondetachable clip magazine, manual safety and adjustable sights. It has a 22-inch barrel and weighs 7.8 pounds. The stock for most examples tends to be of the rifle type with a straight or semi-pistol grip, having a shotgun-style rubber butt plate.

This was the first successful autoloading, high-power rifle in the United States. The basis of its autoloading, semiautomatic mechanism is a rotating bolt head having double lug locks in the barrel extension. The barrel itself recoils inside of a barrel jacket while it is still locked to the bolt. A stop-open latch holds the breechblock open after the last shell is fired.

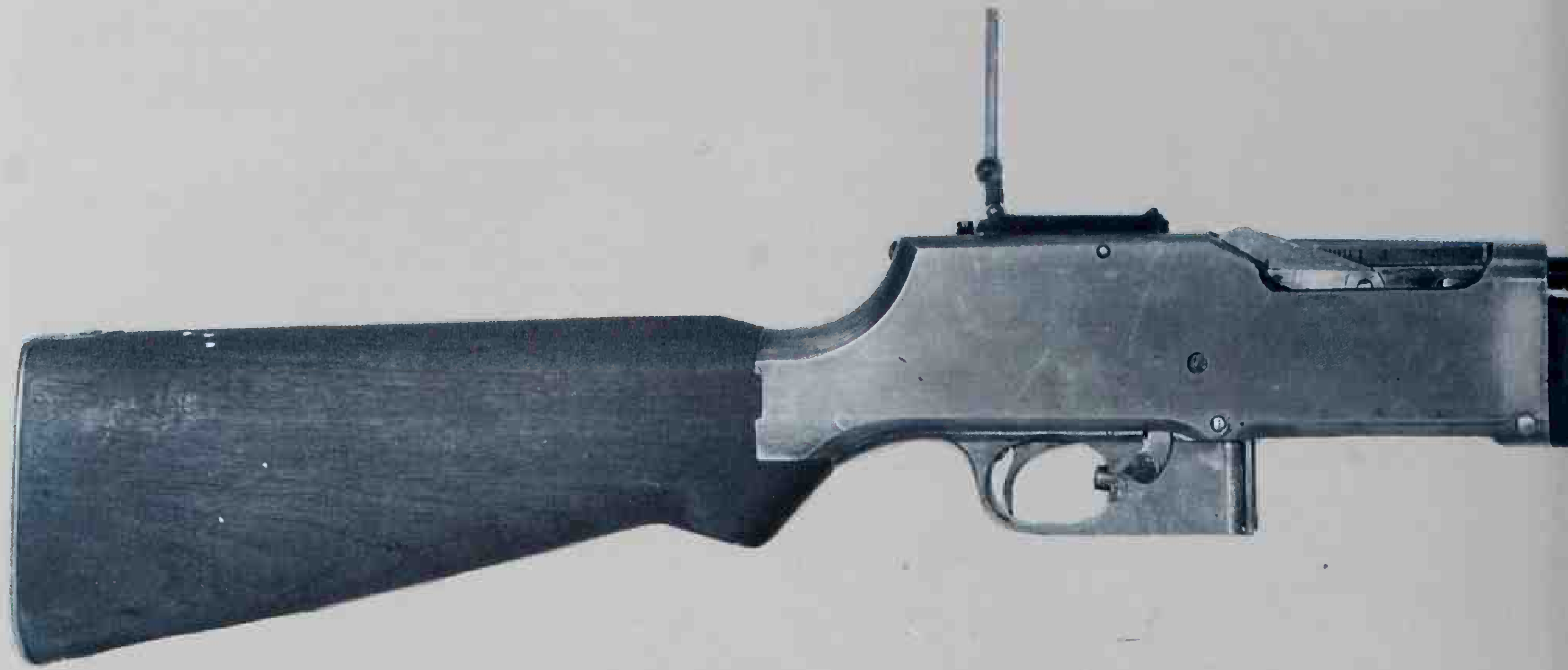
The patent application for this gun was filed on 6 June 1900, and US Patent Number 659,786 was granted on 16 October 1900. US manufacturing and sales rights were granted to the Remington Arms Company, and the rifle first appeared in 1906 as the Remington Model 8 Autoloading Center Fire Rifle. Fabrique Nationale introduced the gun in Belgium in 1910 as the FN Caliber .35 Automatic Rifle.

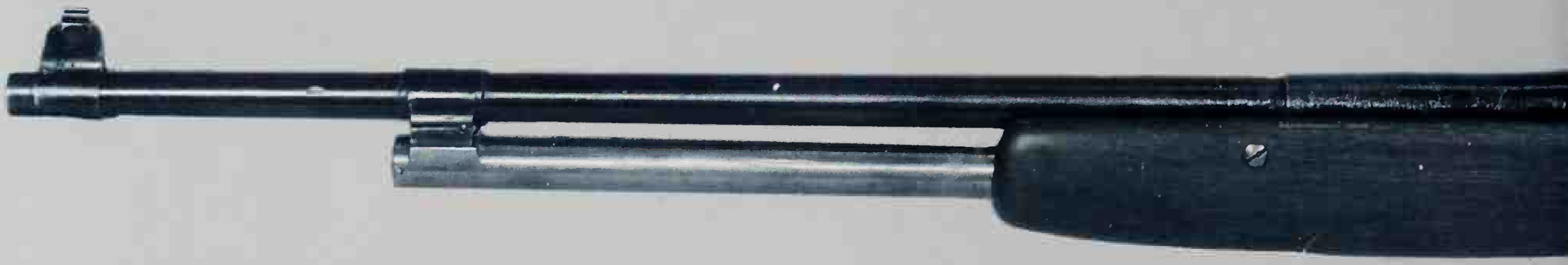
The Remington Model 8 was discontinued in 1936, and was replaced by the Model 81 Woodmaster the same year. Modifications introduced by the Woodmaster included an improved stock and a slight weight increase to eight pounds. The Model 81 was discontinued in 1950. The FN model differed from the Remington models in that it had a solid-matted rib barrel, a bead front sight and two-position-folding rear sight (the Models 8 and 81 had adjustable open rear sights), a checked forearm and buttstock and a weight of 8.3 pounds. The FN model was discontinued in 1931, with a total production of 4913 units. As a matter of company policy, production figures are not available on Remington arms.

The Browning Automatic Rifle (Colt, Winchester, Marlin-Rockwell, Fabrique Nationale and others). This is an air-cooled, gas-actuated, automatic rifle in a variety of calibers, including .30-06, 6.5mm, 7mm, 7.62mm and 7.9mm, and having a 20 to 40-round box magazine and complex safety arrangements which are described below. It can be fired at a maximum full-automatic rate of 480 rounds per minute, emptying a 20-round magazine in 2.5 seconds. The World War II-era variant, the M1918A2, has a high rate of 550 rpm.

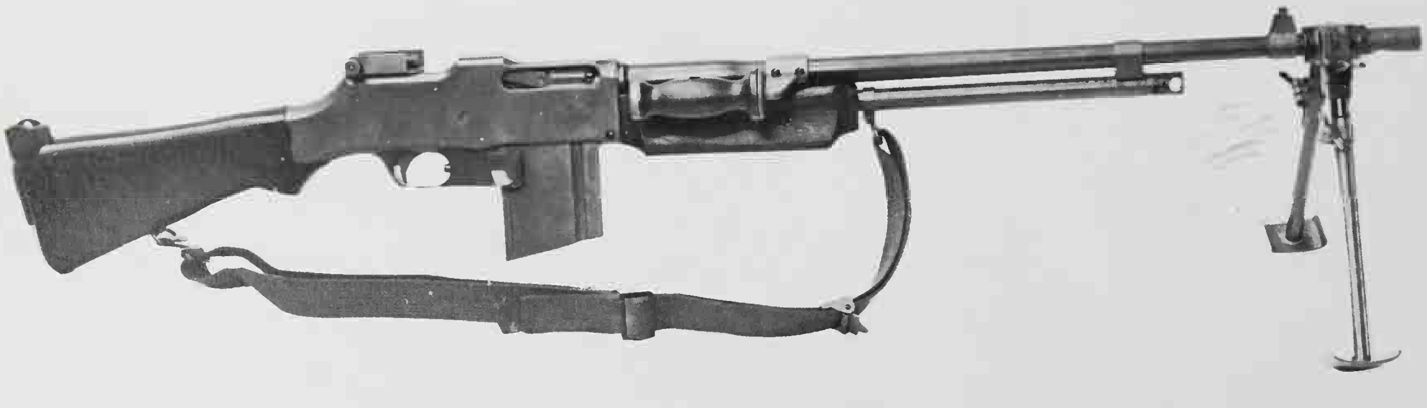

Shanghai
Hangchow
Nagasaki
Kagoshima
KYUSHU
OSUMI IS
RYUKYU IS
FORMOSA
VOLCANO
BATAN IS
BABUYAN IS
C. ENGANO
Aparri
Baguio
LUZON
Quezon City
Philippine
PHILIPPINES
Legaspi
SAMAR
LEYTE
Cebu
MINDANAO
Davao
Sea
1593 Miles
GUAM
YAP
PALAU
Edinburgh
Glasgow
BRITAIN
Newcastle
ENGLAND
Londonderry
Sheffield
Birmingham
Cork
Cardiff
Bristol
Plymouth
LANDS END
SCILLY IS
London
NETHERLANDS
The Hague
BELGIUM
Dover
Calais
Boulogne
Le Havre
Lille
Rouen
Paris
LUX
Nancy
Orléans
FRANCE
Geneva
Lyon
Bordeaux
Nimes
Marseille
Toulouse
PYRENEES
Toulon
Genoa
Milan
Turin
SWITZERLAND
Bern
Zurich
MONACO
Nice
Florence
Livorno
CORSICA
Ajaccio
Rome
SARDINIA
Cagliari
Barcelona
Tortosa
MINORCA
MAJORCA
BALEARIC IS
Vigo
Porto
Coimbra
Lisbon
PORTUGAL
Faro
Cadiz
Bizerte
Bougie
Bône
Constantine
Med
DENMARK
Aarhus
Odense
Kiel
Hamburg
Bremen
Hanover
Amsterdam
Leipzig
GERMANY
Frankfurt
Mannheim
Stuttgart
Munich
Strasbourg
Venice
Palermo
Tunis
Sea

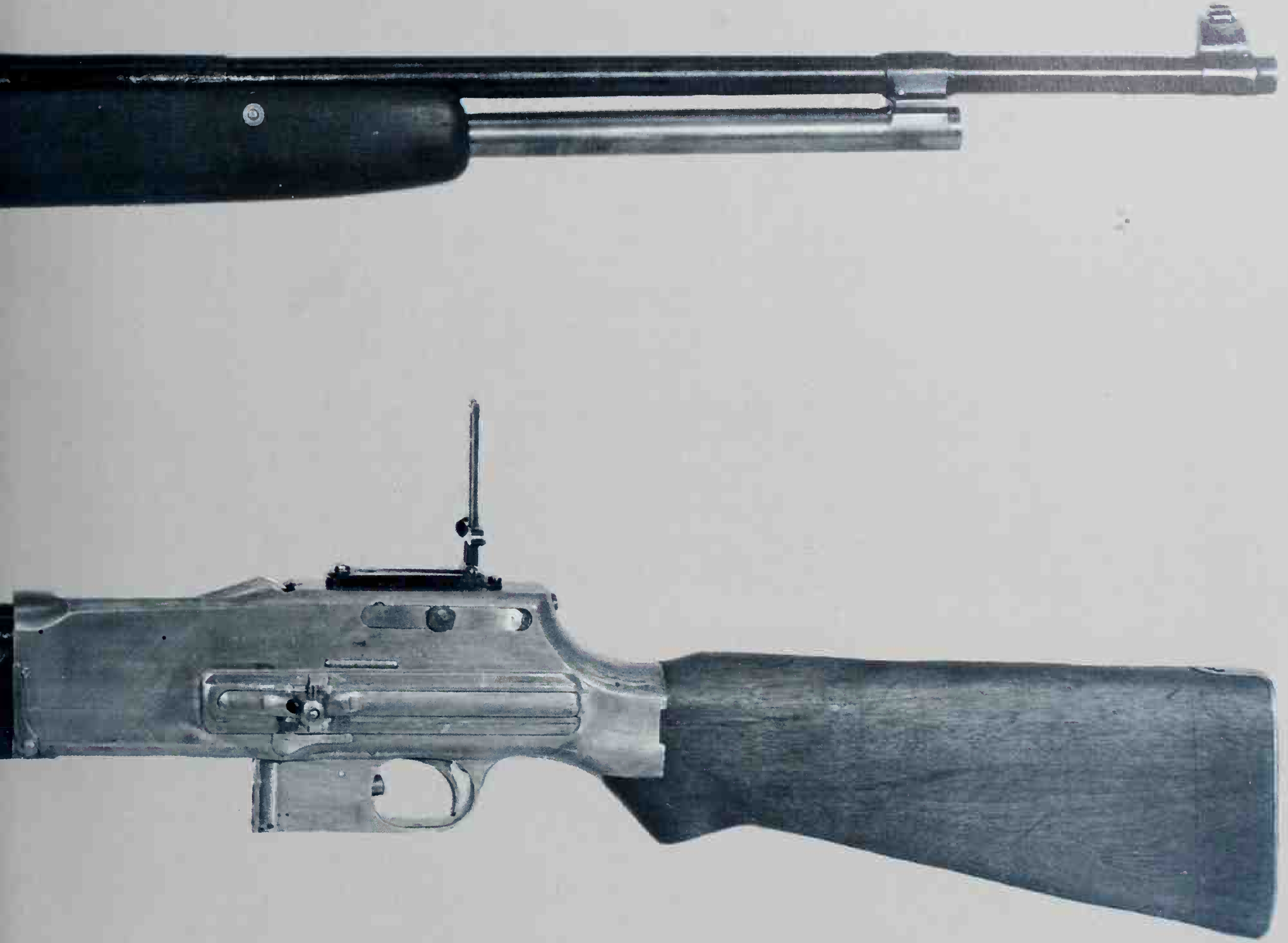
At top: **Browning's original for the Semiautomatic High Power Rifle.** ***Below, from the top down:*** **Two of the best known American military arms, the BAR and the Government .45 Caliber Automatic Pistol.** ***Opposite:*** **John and Matt Browning on an elk hunt.**





Model 1918A1





At top: **Two views of John M Browning's automatic rifle, made in his shop in Ogden, Utah. A forerunner to the US Automatic Rifle Model 1918, this rifle has uncontrolled top ejection. Another variant of the BAR, the Model 1918A1 *(far left)* has a hinged butt plate and bipod attached just ahead of the fore end stock.** ***Left:*** **The Browning Automatic Rifle in action.**

Best known as the 'BAR,' it is also known as the Browning Light Machine Rifle Model 1917, the Light Browning, the Colt Automatic Machine Rifle and the Fusil Mitrailleur Browning. This rifle has a 24-inch barrel and weighs approximately 20 pounds with a full magazine. Sights are adjustable, and the stock is a heavy rifle type arrangement.

The safety for this automatic weapon is a fire-control change lever. When the change lever is in its forward position, marked with the letter 'F,' the rifle will shoot one shot with each pull of the trigger. In vertical position, marked with the letter 'A,' the rifle will fire at full automatic. In the rearward position, marked by the letter 'S,' for 'safe,' the weapon will not fire.

On some models, when the 'F' lever is all the way forward, the rate of fire is reduced in such a way that single shots may be effected by jerking and releasing the trigger. On the M1918A2, there is no provision for semiautomatic fire, but this last-mentioned method for firing single shots can be used. The M1918A2 also differs from earlier models in that it is slightly heavier and is equipped with a flash hider and bipod.

The patent application for the first of these designs was filed on 1 August 1917, and US Patent Number 1,293,022 was granted on 4 February 1919. The BAR was officially adopted by the United States Government in 1917 and first saw combat use in July 1918. It is designed for takedown in combat conditions, and its 70 pieces can be completely disassembled and reassembled in 55 seconds.

The BAR has a bolt lock which is pivoted to the rear of the bolt and which rises in and out of locking engagement with a shoulder on the receiver. The rear of the bolt lock is attached to the slide by a link, which is free to reciprocate backward and forward. Attached to the forward part of the barrel is a gas piston which derives its energy from a gas port drilled through the barrel wall. In operation, the piston sends a slide to the rear, and in turn, the slide, through its link connection with the bolt lock, pivots the bolt lock downward—out of locking contact with the receiver.

During World War I, approximately 52,000 BARs were manufactured by Colt, Winchester and Marlin-Rockwell. After World War I, production rights reverted to Colt, and also, by arrangement with John M Browning, Fabrique Nationale began European production in 1920. The FN model is called the Fusil Mitrailleur Leger. Large quantities of this weapon were manufactured for various European countries over the years. It has been widely copied; many nations adopted the BAR or a have had a similar gun in reserve.

In 1922, the US Army brought out its Cavalry Model. In 1933, Colt produced the 'Colt Monitor' for police and bank guard use. In November 1939, there were approximately 87,000 in our war reserve, and approximately 177,000 were produced in this country during World War II. The FN version differed from the Colt model chiefly in having a quicker takedown mechanism—which allowed the barrel to be removed easily for replacement.

Below: **John and Rachel Browning at home, a few months before his final trip to Belgium.** ***Opposite:*** **American troops in Europe during WWII. US forces used the BAR during both World War I and II.**

John M

A Selection of John M Browning's Shotguns

Model 1887 Lever Action Repeating Shotgun (Winchester). It is a lever action repeating shotgun in 10 or 12 gauge, with a four-shot tubular magazine (plus one in the chamber), and groove and bead sights. Examples of this shotgun type have 20, 30 or 32-inch barrels, with cylinder bore, riot, standard or full choke. The 10 gauge variants weigh approximately nine pounds, and the 12 gauge variants weigh approximately eight pounds. Stocks for these guns are standard plain with pistol grip and hard rubber butt plate.

This was the first lever action repeating shotgun made in the United States. It has been called 'the first really successful repeating shotgun.' The patent application on this gun was filed on 15 June 1885 and US Patent Number 336,287 was granted on 16 February 1886. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1886, and the manufactured gun appeared in June 1887 as the Winchester Model 1887 Shotgun. Riot gun variants in 10 and 12 gauge were brought out in 1898.

The model 1887 was discontinued in 1899. Redesigned to handle the new smokeless powder loads, it reappeared in 1901—in 10 gauge only—as the Model 1901. This model was discontinued in 1920. Some 64,855 units of the Model 1887 were produced, as were 13,500 units of the Model 1901, for a grand total of 78,355 units overall.

Model 1893 Pump Action Repeating Shotgun (Winchester). This is a pump action shotgun of 12 gauge, with a five-shot tubular magazine and bead and groove sights. Barrel lengths for this gun are 30 and 32 inches, with standard full choke and optional cylinder-bore and modified

Browning's Shotguns

John M Browning's revolutionary automatic shotgun made firearms history even before it was manufactured by precipitating a break between Browning and Winchester. Invented in 1900, the design has remained popular to this day. The sleek Automatic-5 *above* is a current production model. Browning *(at left)* holds an early model of this legendary shotgun.

Above: **Two views of Browning's pilot model for the first successful lever action shotgun. Made by Winchester, it was introduced as the Model 1887.** ***Below:*** **The Model 1897, one of the most popular shotguns in America, saw action with American Express Agency messengers and World War I Doughboys. This finely engraved model is a trap gun.**

variants available. The weight for all models is approximately 7.8 pounds, and stocks tend to be plain, with pistol grip and hard rubber butt plate, with options having been available.

This was the first shotgun with a sliding-forearm pump action manufactured by Winchester. The patent application for this gun was filed on 30 June 1890, and US Patent Number 441,390 was granted on 25 November 1890. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1890; the gun was announced in April 1894 as the Winchester Model 1893.

The Model 1893 was discontinued in 1897 when the Model 1897—a much-modified takedown version of the Model 1893—was introduced. Total production for the Model 1893 was 34,050 units.

Model 1897 Pump Action Repeating Shotgun. This is a pump action shotgun in 12 and 16 gauge with a five-shot, tubular magazine, and bead and groove sights. Variant examples had barrel lengths of 20, 22, 26, 28, 30 and 32 inches (plus other variants), with cylinder bore, modified, intermediate, full or Winchester skeet chokes. The weights of the various examples of the Model 1897 are from 7.1 to 7.9 pounds, and standard stocks are plain, with pistol grip and hard rubber butt plate, with optional checkering and other specialties having been available.

This was one of the most popular shotguns in America. Introduced in November 1897, the Model 1897 is a modified version of the Model 1893, with a stronger frame, side ejection, and takedown capability. In addition to its legendary record as a sporting arm, the Model 1897 also saw other usage. It was widely used as a law-enforcement riot gun, and the American Express Agency armed its messengers with Model 1897s for a time. During World War I, this weapon was used by American forces as a trench gun with much effectiveness.

Back in 1897, the Standard, Trap, Pigeon and Brush Gun variants were introduced, and in 1898, the Riot Gun variant was brought out. This was followed by the Tournament Model in 1910, and the Trench Gun—for Armed Forces use during World War I, and for the public in 1920. The Trap Gun was succeeded by the Special Trap Model in 1931, and the Brush, Riot, Trench and Pigeon models were discontinued in 1931, 1935, 1935 and 1939, respectively. The Tournament Model was succeeded in 1931 by the Standard Trap Model, which itself was discontinued in 1939.

The Standard Model 1897 was discontinued in 1957. After all was said and done, the overall production total for all Model 1897 variants was 1,240,700.

Automatic Shotgun (Fabrique Nationale, Browning, Remington and others). This is a long recoil-operated automatic shotgun. The following specifications refer to the most representative group of variants, the Browning Automatic-5 family of shotguns. These come in gauges 12, 16, 20 and three-inch Magnum 12, with a five-shot magazine, except in three-inch Magnum, which has a five-shot capacity with Folding Crimp three-inch shells and a four-shot capacity with Rolled Crimp three-inch shells. Barrel lengths for the Auto-5 run from 26 to 32 inches, depending on type specifications and option package, and include all possible choke borings, including interchangeable, screw-in, choke systems. Weights tend to run from 6.3 to nine pounds, again depending on variant type. Stocks are a standard, hand checkered, French walnut type with semi-

pistol grip, and deluxe engraved specials have been available.

This was the world's first successful automatic shotgun, an unheard-of thing in its day, and immediately successful, selling 10,000 guns in its first year of production. John M Browning took out four patents on this revolutionary firearm. US Patent Number 659,507, filed on 8 February 1900, was granted on 9 October 1900; US Patent Number 689,283, filed on 18 March 1901, was granted on 17 December 1901; US Patent Number 710,094, filed on 11 January 1902, was granted on 30 September 1902; and US Patent Number 812,236, filed on 30 June 1904, was granted on 13 February 1906.

The automatic shotgun was first manufactured by Fabrique Nationale, for the Browning Arms Company, in 1903. In 1905 the Remington Arms Company was licensed to manufacture and sell the gun, bringing it out as the Remington Model 11 Automatic Shotgun. The Browning Automatic-5 is the Browning Arms Company model.

The Automatic utilizes the forces which are generated by firing the cartridge to eject the empty case, to load a fresh round from the magazine into the chamber, and to cock the gun automatically.Through a simple, but highly effective, adjustable friction break and shock absorber, Browning was able to make the gun adaptable to whatever cartridge loads were desired.

The original Browning Automatic Shotgun is in 12 gauge only, with a 28-inch barrel; full, modified or cylinder bore choke; and is chambered for any cartridge up to 2.8 inches. Its weight is about 7.8 pounds and stocks tend to be English walnut with a straight grip. The gun exists in three models, all of them takedown-capable. These represent the Regular, Trap and Messenger (20-inch barrel) guns. While these models are generally of five-shot capacity, there are also two-shot variants.

The Remington model that was manufactured in 1905 is practically identical to the Browning Automatic-5, many of the parts being interchangeable. It differs in the following details. The butt plate is of hard rubber. The stock had a full pistol grip. The safety is of the cross-bolt style but with no finger piece. There is no magazine cut-off. The forearm has a reinforcing dowel which the Automatic-5 does not have. The carrier is of the old style, without the quick-loading feature. The front trigger-plate screw is a pin, and the rear trigger-plate screw has no locking screw. On some of the early Remington models, the carrier latch screw and cartridge stop screw are pins with a transverse locking screw. There is a fiber cushion in the rear of the receiver to stop the breechblock and firing pin. On some early models, the firing pin is identical to the Automatic-5; on later models, the firing pin was changed to a straight cylinder which won't lock when the action is open. There were other very minor differences in detail, depending on the year of manufacture.

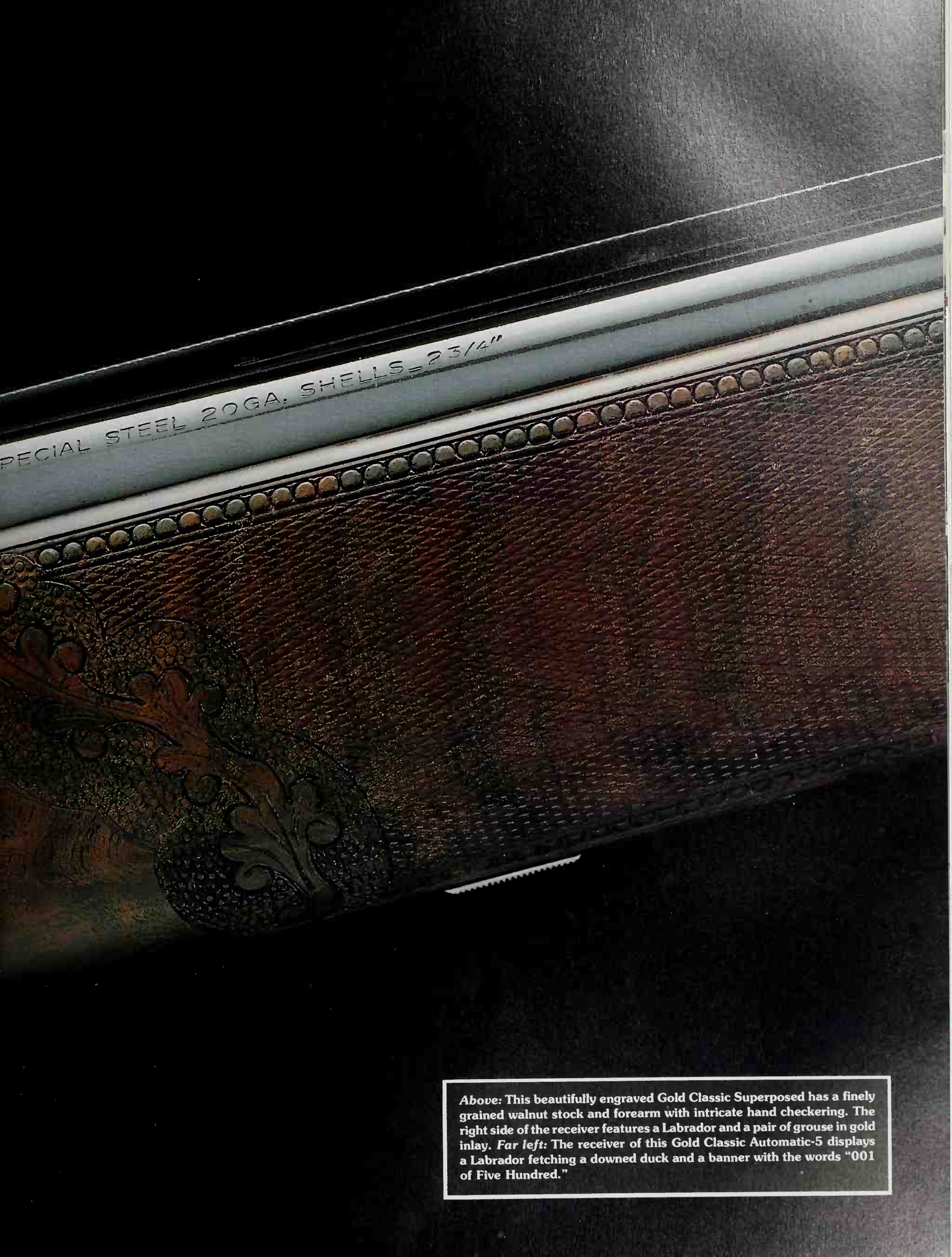
Two variations in the Browning gun were offered in 1921—a Police Special, in 12 gauge, and a short-barrel Riot Gun, in 12, 16 and 20 gauge. The Model Sportsman, a three-shot version of the Model 11, with semi-beavertail fore end, was introduced in 1931. All models of the Model 11 and the Model Sportsman were discontinued in 1948. The Remington Model 11-48 Autoloader was introduced in 1949, and except for changes made to streamline the gun and make it easier to manufacture, it still has the same basic action as its predecessor.

The Browning Automatic-5 is still in production and is offered in many different specifications. Combined production figures on this gun cannot even be estimated.

Model 17 Pump Action Shotgun (Remington). This is a pump action, underloading shotgun in 20 gauge, with a five-shot tubular magazine, and groove and bead sights. Barrel lengths for all variants tend to be 18.5, 20, 26, 28, 30 and 32 inches, with standard full choke and optional chokes. The weights for various examples tend to be around 5.3 pounds, and stocks are as follows. Standard and riot models are checkered with a straight grip and hard rubber butt plate, while police models feature a pistol grip only, with no shoulder stock.

FIVE HUNDRED

BROWNING GOLD CLASSIC
J.BAERTEN



Above: **This beautifully engraved Gold Classic Superposed has a finely grained walnut stock and forearm with intricate hand checkering. The right side of the receiver features a Labrador and a pair of grouse in gold inlay. *Far left:* The receiver of this Gold Classic Automatic-5 displays a Labrador fetching a downed duck and a banner with the words "001 of Five Hundred."**

This was John M Browning's last repeating shotgun. The patent for this gun was filed on 26 November 1913, and US Patent Number 1,143,170 was granted on 15 June 1915. The Remington Arms Company was granted manufacturing and sales rights to this model, introducing it in 1921 as the Remington Model 17.

All production was discontinued in 1933. Since its patent expiration, the design has been used with marked success by various manufacturers, with examples being made in all gauges. For instance, the Ithaca Model 37 Pump is of the same basic design except that it is in 12 gauge. No production figures are available on the Model 17.

Superposed Shotgun (Fabrique Nationale and Browning). This is an over and under double-barrel shotgun in 12, 20, 28 and .410 gauge, including Magnum loads,

Model style: Standard, Magnum, Lightning, Lightning Trap, and Broadway Trap 12 gauge; Standard and Lightning 20 gauge; Standard 28 gauge; Standard .410 gauge. Barrel lengths for the Browning Superposed Shotgun run the gamut from 26.5 to 32 inches, with extra barrel sets available for each gun, and can be found in all possible choke borings. Weight also varies widely—from six to 8.1 pounds, depending upon varaint and barrel choice, etcetera. Stocks are a standard hand-checkered, hand-rubbed walnut, with a semi-pistol grip. However, deluxe engraved specials are also common.

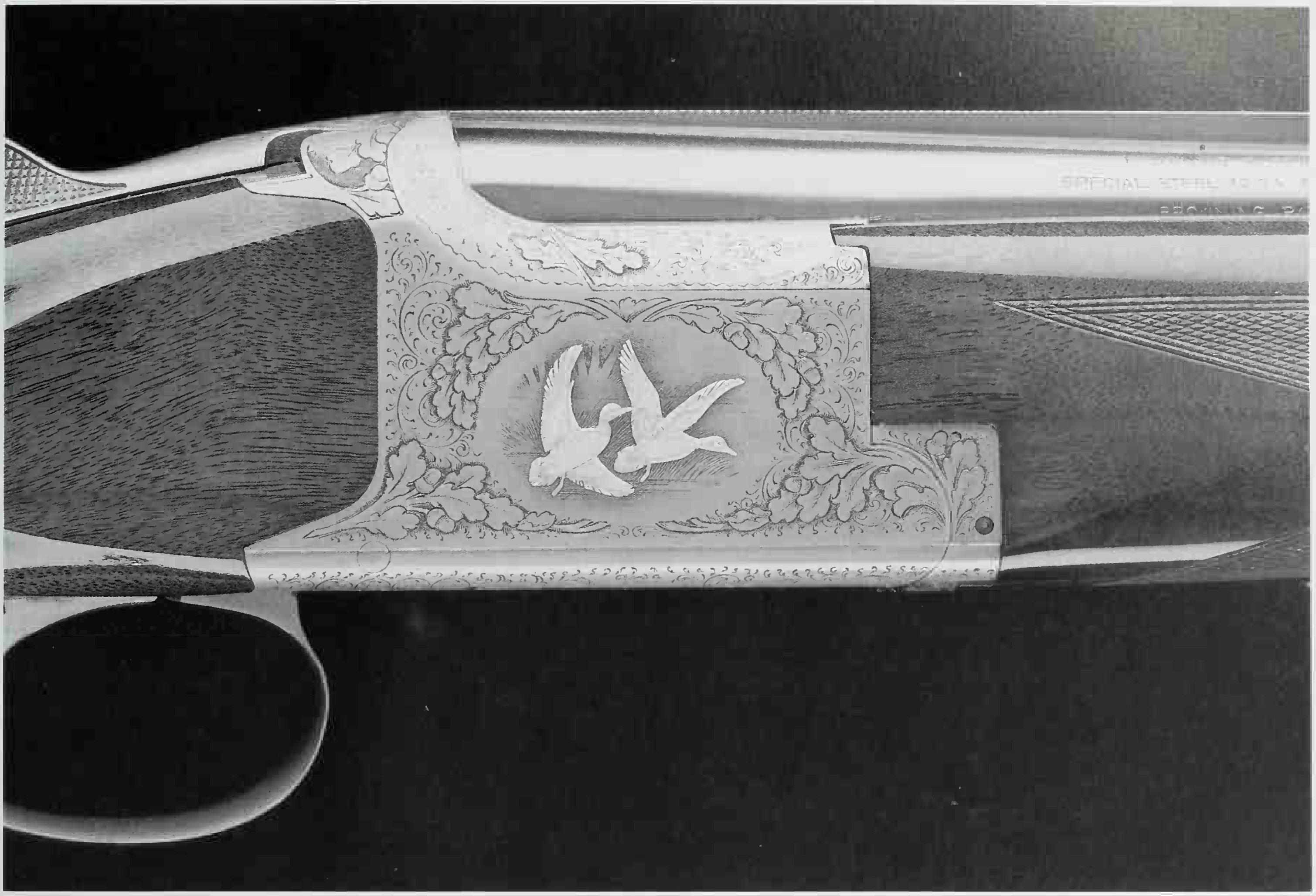
The Superposed Shotgun was John M Browning's last invention. Patent applications on this gun were filed on 15 October 1923 and 29 September 1924, and US Patent Numbers 1,578, 638—39 were granted on 30 March 1926. First Produced by Fabrique Nationale in 1930, the Superposed Shotgun appeared in the Browning Arms Company line in 1931.

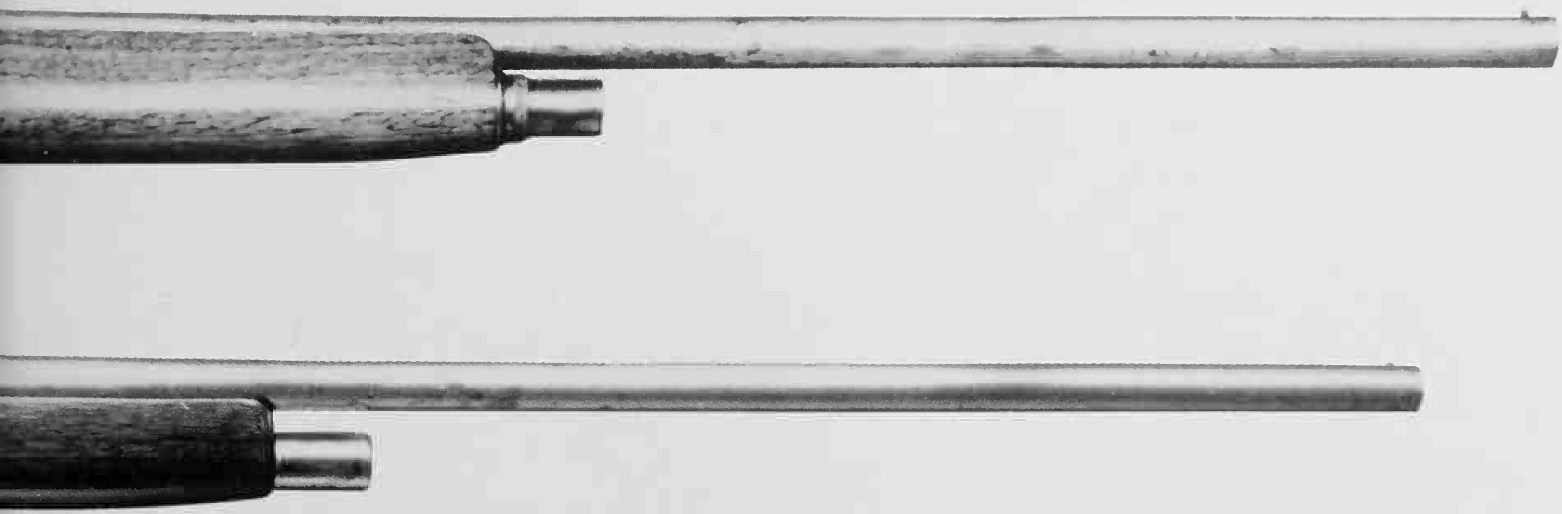
The barrels are mounted one above the other, rather than side by side, to permit the improved accuracy of a single sighting plane. Shells are placed directly in the two chambers. Automatic ejectors flip out the spent shells when the gun is opened. Unfired shells are merely elevated by the ejectors for easy removal by hand, if desired. This is made possible by the various physical differences between spent and unspent shells.

The first Superposed models had double triggers. Later, John M Browning's son, Val A Browning, designed twin single triggers for the gun, and ultimately the single selective trigger. The twin single triggers differed from the double triggers in that after selecting and shooting one round in one barrel, a second pull on the same trigger would fire the remaining barrel, thus eliminating the necessity of moving the finger from one trigger to the other. In the final version, the single selective trigger fires both barrels, either barrel first, by moving a thumb selector. The Superposed was initially provided only in 12 gauge in the United States. Val A Browning later designed the 20 gauge variant for American sale.

The Browning Superposed is still in production and is currently available in a wide variety of custom specifications.

At top: A Browning designed Remington Model 17 Pump Action Shotgun. *Below, at bottom:* Two of Browning's models for the automatic shotgun. Since the fourteenth century Belgian engravers have been renowned for their artistry, and the tradition lives on today at Fabrique Nationale in Liège. *Below:* The Presentation One Superposed, with a pair of gold inlaid mallard ducks on an engraved receiver, is an example of their fine craftsmanship. *Overleaf:* A Black Duck Limited Edition Superposed Shotgun and a BAR Big Game Series Limited Edition.





Whil

Deer
437PY00444
444 OF SIX HUNDRED
BROWNING SUPERPOSED
SPECIAL STEEL 12GA. SHELLS

Little-Known Browning Arms

Among the patents that were assigned to John M Browning, but not specifically mentioned in the previous listings, are 32 patents covering entire firearms for which there are no known surviving models. In addition, several models were often covered by the same patent. It is known, for example, that Browning designed several additional experimental models of both the .45 caliber Government and the .22 caliber long rifle practice pistols. The total of John M Browning's original firearms models is therefore well over 100.

Also, no mention has been made here of the Browning Double Automatic. This shotgun was invented not by John M Browning himself, but by his son Val A Browning—while he was president of the Browning Arms Company. The invention of this firearm is of note here, as it is one of a number of fine examples of the continuing Browning family gunmaking tradition.

To clear up an ongoing confusion, mention should also be made of the FN-Browning Light Automatic Rifle, Caliber .308, the standard infantry rifle for the NATO nations. Despite its name, this weapon was not a Browning invention. The following excerpt from the Fabrique Nationale descriptive brochure on this gun explains why it is so designated:

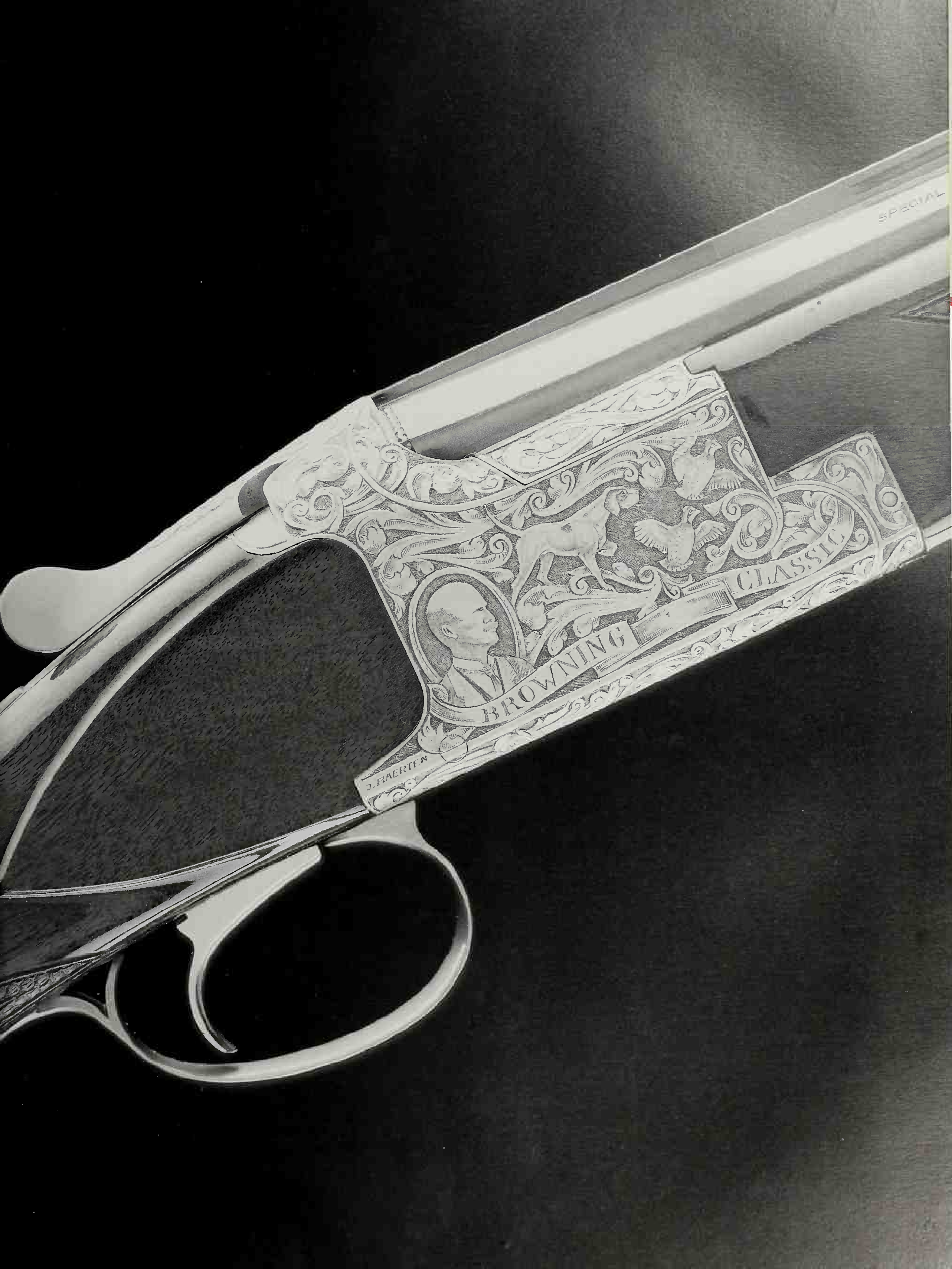
'The designer of this weapon was Mr DD Saive, Chief of Weapon Design and Development at FN, who, in the course of his career was able to gain an extensive experience in automatic weapons. For many years he collaborated with the great inventor, JM Browning. It is not surprising, therefore, that one finds in this rifle, in several places, features which first appeared in Browning mechanisms (gas intake and piston, wire-spring-actuated extractor, recoil spring housed in the buttstock); and thus it can be said that the weapon is of Browning inspiration—a natural consequence of more than 50 years of continuous collaboration between the FN and Browning companies.'

Of the 44 firearms John M Browning sold to the Winchester Repeating Arms Company, thirty-one were rifles. Of this number only seven were manufactured. Among the 24 not manufactured are a .38 caliber, tubular magazine, lever action rifle; a .30 caliber, box magazine, pump action rifle; and a .30 caliber repeater in which the operant mechanism is very much like a backwards-mounted lever action.

In addition, John M Browning submitted three other rifles to Winchester which were neither patented nor manufactured. These include a .44 caliber pump action repeating rifle, a .22 caliber single shot rifle, and a .45 caliber lever action single shot rifle. It is assumed that these guns were not patented because of previously existing patents, and consequently were not purchased by Winchester, although the models remain in the Winchester Gun Museum.

Also, John M Browning sold 13 shotguns to the Winchester Repeating Arms Company. Of these, only three were manufactured. One of the shotguns John M Browning submitted to Winchester, a 12-gauge, pump action shotgun, was neither patented nor manufactured. It is assumed that this gun was not patented because of previously existing patents and consequently was not purchased by Winchester, although the model remains in the Winchester Gun Museum.

Below: John M Browning's workbench, with some tools made by his father way back in the 1830s. _Opposite:_ An intricately engraved Superposed steel receiver inscribed with the engraver's name.


SPECIAL
BROWNING
CLASSIC
J. BAERTEN

Browning's and Aircraft

A Selection of Browning Machine Guns

In the fall of 1889, John M Browning made several experimental models which served as preliminary steps in his development of a gas-operated, fully automatic gun that would fire continuously as long as the trigger is pulled and a supply of cartidges is being fed into it.

The first of these was derived from a Winchester Model 73 lever action. Browning put a hinge on the muzzle end of the barrel which operated a gas flapper that was attached to the modified lever of the rifle. Though this crude machine gun was built in a single day, it worked. Several others were made—all working out the machinations necessary to perfect his gas-operation experiment.

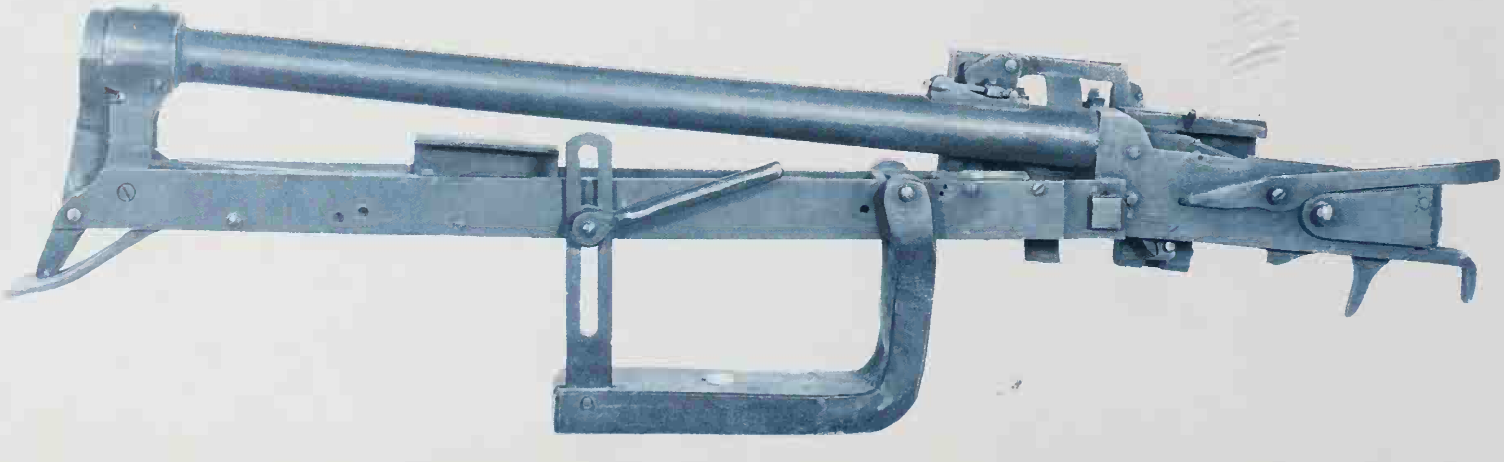
A patent application was filed on 6 January 1890, and US Patent Number 417,782 was granted on 29 March 1892. This was John M Browning's first patent embodying his gas-operation principle for the machine gun. Browning noted in the application that 'This invention is applicable to machine guns and also to firearms.'

The final experiment had a concave cap with a hole in the center which was fitted directly over the muzzle. When the bullet passed down the barrel and through the hole in the cap, the expanding gases that followed the bullet forced this cap forward. Attached to the cap was a spring-loaded operating lever that was connected also to the gun's firing mechanism. When a shot was fired, the cap would move, trigger the operating lever which in turn 'pulled' the trigger, creating an identical repeat process. This could, hypothetically, go on indefinitely, providing the trigger was held in the 'pulled' position, there were enough cartridges to fire and the barrel of the weapon didn't melt from the heat of continuous firing.

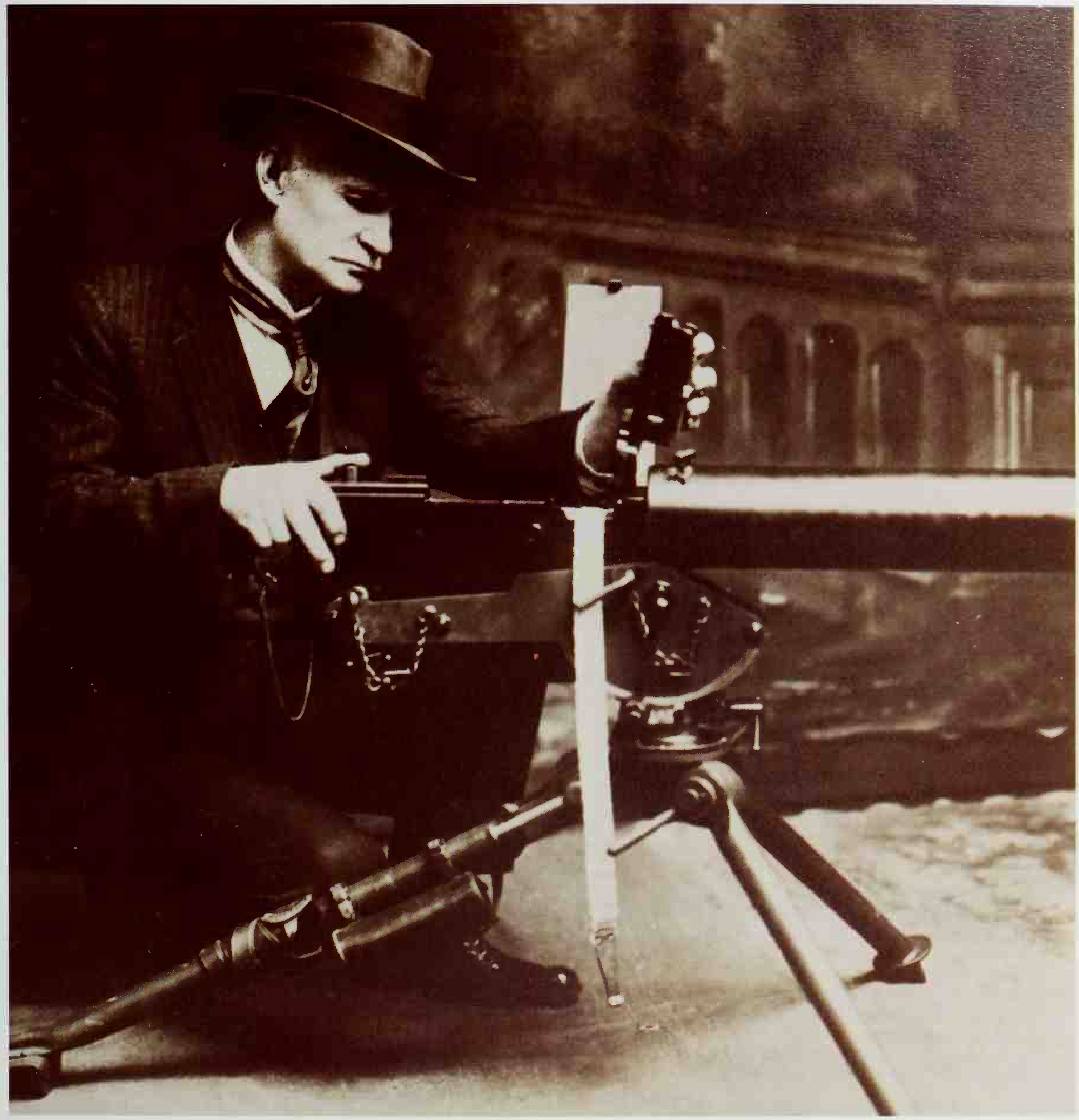
This weapon is referred to in Browning's patent as an 'Automatic Magazine Gun.' It fired .44-40 black powder ammo at the rate of 960 rounds per minute, and weighed approximately eight pounds. It was not, however, considered ready for production.

The first Browning Gas-Operated Machine Gun. This is a gas-operated full automatic weapon in .45-70 caliber, with a belt magazine, a cyclic rate of fire of 600

Below: **John M Browning's first gas-operated machine gun, circa 1890–91, made solely for testing.** ***Opposite:*** **Browning and an infantry variant of the Model 1917 .30 Caliber Machine Gun.**



Machine Guns Cannon



rounds per minute and a barrel length of 22.5 inches. This gun weighs 40 pounds with its mount.

This was John M Browning's first fully developed machine gun. This gun was invented in 1890–91. The patent application was filed on 3 August 1891 and US Patent Number 471,783 was granted on 29 March 1892.

Browning placed a bracket on the muzzle end of the barrel of this model. On it, a lever was hung on a pivot, so that one end of the lever formed a cap over the front of the muzzle. This cap contained an aperture corresponding to the bore of the barrel, to allow passage of the bullet. The muzzle bracket acted as a spacer to keep the lever cap a short distance forward of the muzzle, thereby forming a small, enclosed gas chamber between the end of the barrel and the cap.

When a shot was fired, the expanding gases following the bullet pushed the cap forward. The cap lever was in turn connected to the action by a series of rods and levers—thus, the forward action of the muzzle cap was the initial impetus which carried through the mechanism, effecting extraction, ejection, feeding, loading and firing of the cartridges automatically.

Gas-Operated Breechloading Gun. The patent application on this gun was filed on 11 July 1892, and US Patent Number 502,549 was granted on 1 August 1893.

A new idea appeared in this model: the energy was not taken from the muzzle—instead, a hole was drilled through the barrel, tapping the high-pressure gases directly behind the bullet before the bullet had left the barrel. Actually, holes were drilled on both sides of the barrel, and a pair of flappers was positioned near these holes.

The flappers were, in turn, attached to the operating rod on the bottom of the barrel. The expanding gas that was tapped from behind the bullet (via the holes) caused both flappers to pivot rearward, imparting motion to the operating rod, and subsequently to the operating mechanism.

One possible reason for this arrangement is that it may have helped to ameliorate the instability at the muzzle which resulted from the unbalanced action of a single flapper. However, as soon as this two-flapper mechanism was created, Browning became aware of many possibilities for simpler mechanisms.

Model 1895 Automatic Machine Gun (Colt). This is a gas-operated machine gun in .30-40 Krag and 6mm Lee Enfield calibers, with a belt magazine and a cyclic rate of fire of 400 rounds per minute. It is an air-cooled weapon, with a 21.5-inch barrel, and weighs 40 pounds.

This was the first fully automatic weapon to be purchased by the United States Government. The first patent application of this gun was filed 7 November 1892, and US Patent Number 544,657 was granted on 20 August 1895. Various modifications of the gun were covered by various US Patents—Number 544,658, filed on 15 March 1893 and granted 20 August 1895; Number 544,659, filed on 11 September 1893 and granted on 20 August 1895; and Number 543,567, filed on 16 April 1895 and granted 30 July 1895.

Arrangements were made with Colt's Patent Firearms Manufacturing Company in 1895 for the gun's manufacture the same year. In January 1896, the Model 95 was tested by the Navy in competitive trials. Its successful performance resulted in the Navy's placing an order with Colt for fifty of these guns. In the hands of US Marines, these Model 1895 Machine Guns saved the foreign legations in Peking during the Boxer Rebellion.

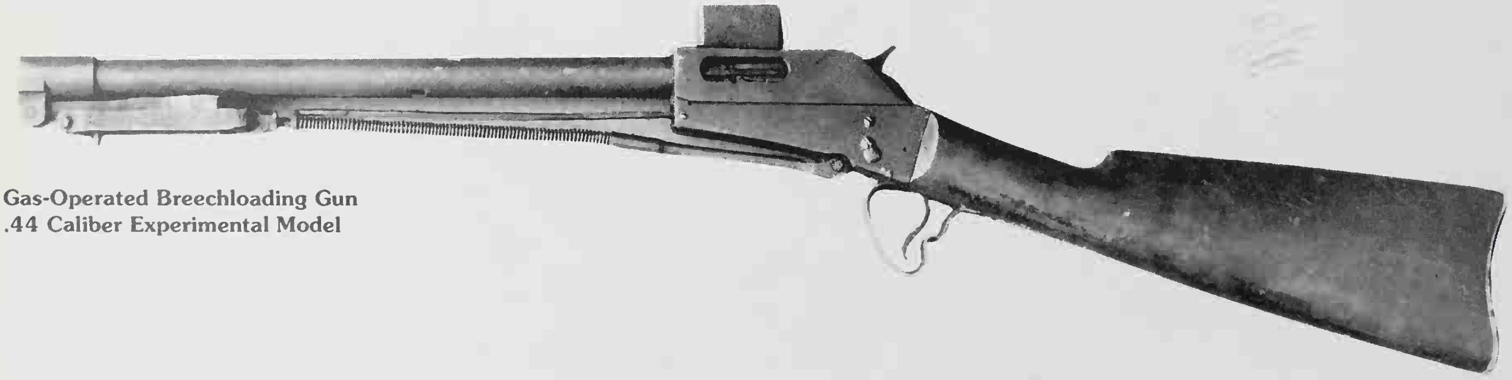
After their use in the Spanish-American War, the Model 95 acquired a nickname—the 'Browning Peacemaker.' At the outbreak of World War I, the Model 1895 comprised a large portion of the United States machine gun arsenal, and though by the second decade of the twentieth century, the gun was outdated, a number were manufactured for military use in the interim before the Model 1917 Browning Heavy Water-Cooled Machine Gun went into production. The Model 1895 was then relegated to training use.

The Model 1895 Machine Gun employed a hole drilled through the barrel near the muzzle, which powered a piston that worked the mechanism of the gun via a swinging lever. When the mechanism was activated, it fed, fired, extracted and ejected the cartridges automatically. The firing cycle was continuous as long as the trigger was depressed and ammunition was supplied, and a very heavy barrel was used on the theory that the extra metal would help prevent heat buildup. The unusual movement of the piston, which swung in a half arc beneath the barrel, gave the gun an additional nickname—'The Potato Digger.'

This gun was discontinued in 1917. Total production figures are not available. Some 1500 were produced during World War I.

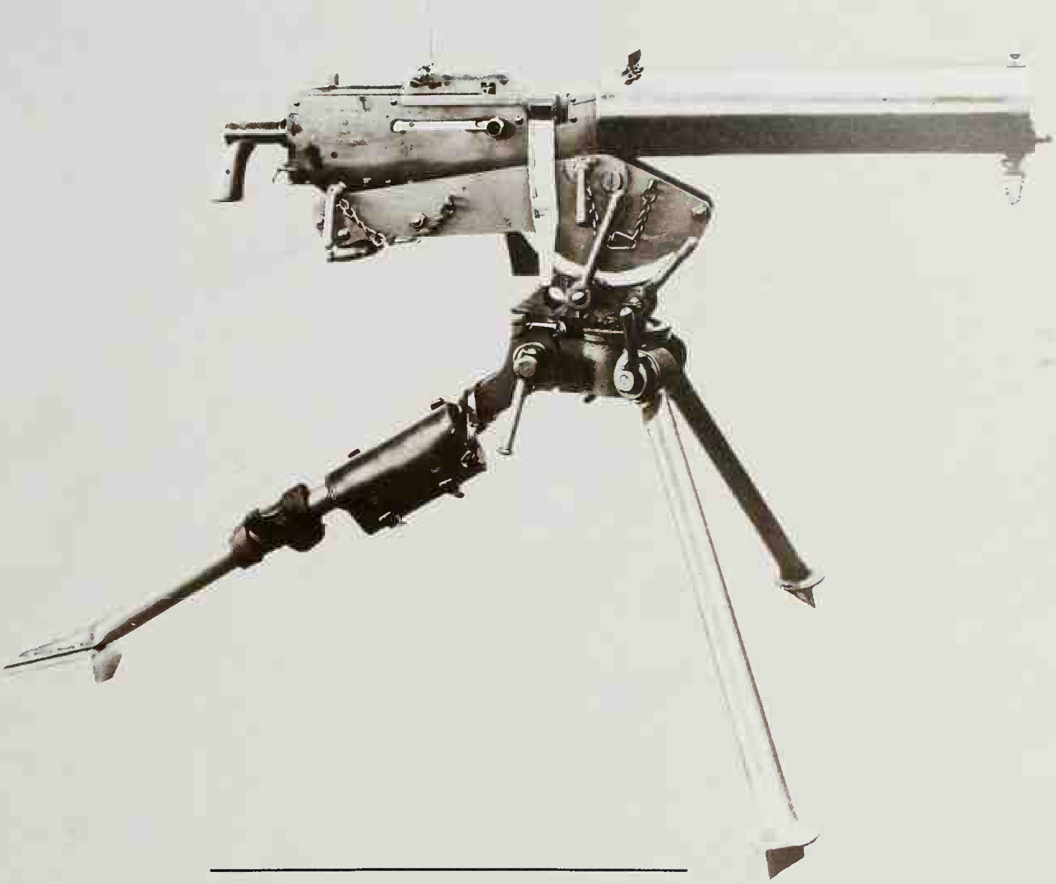
Experimental Gas-Operated Firearm. This is an experimental gas-operated machine gun in .44 caliber, with a 20-shot box magazine and a cyclic rate of fire of 720 rounds per minute. It has a 14.5-inch barrel and weighs 7.3 pounds.

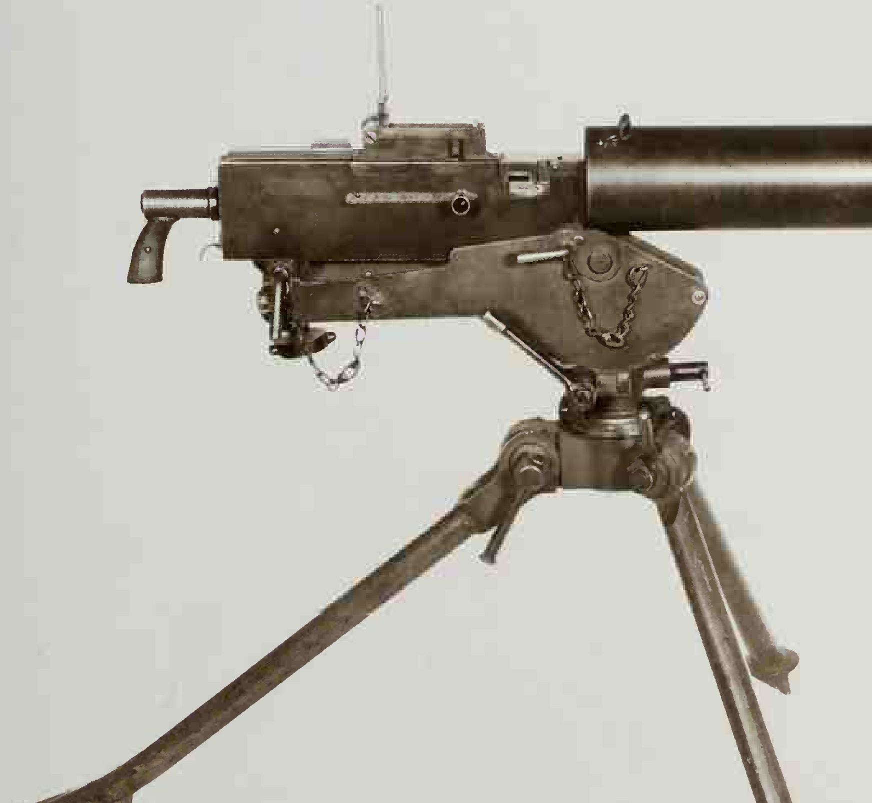
This was an important test model, designed to improve upon the ideas that were already in operation on the Model 1895 Machine Gun. After their testing in the Experimental Gas-Operated Firearm, many of these improvements would go into the later models that would see action in some of the most intensive conflicts in our present war-heavy century.



Gas-Operated Breechloading Gun
.44 Caliber Experimental Model

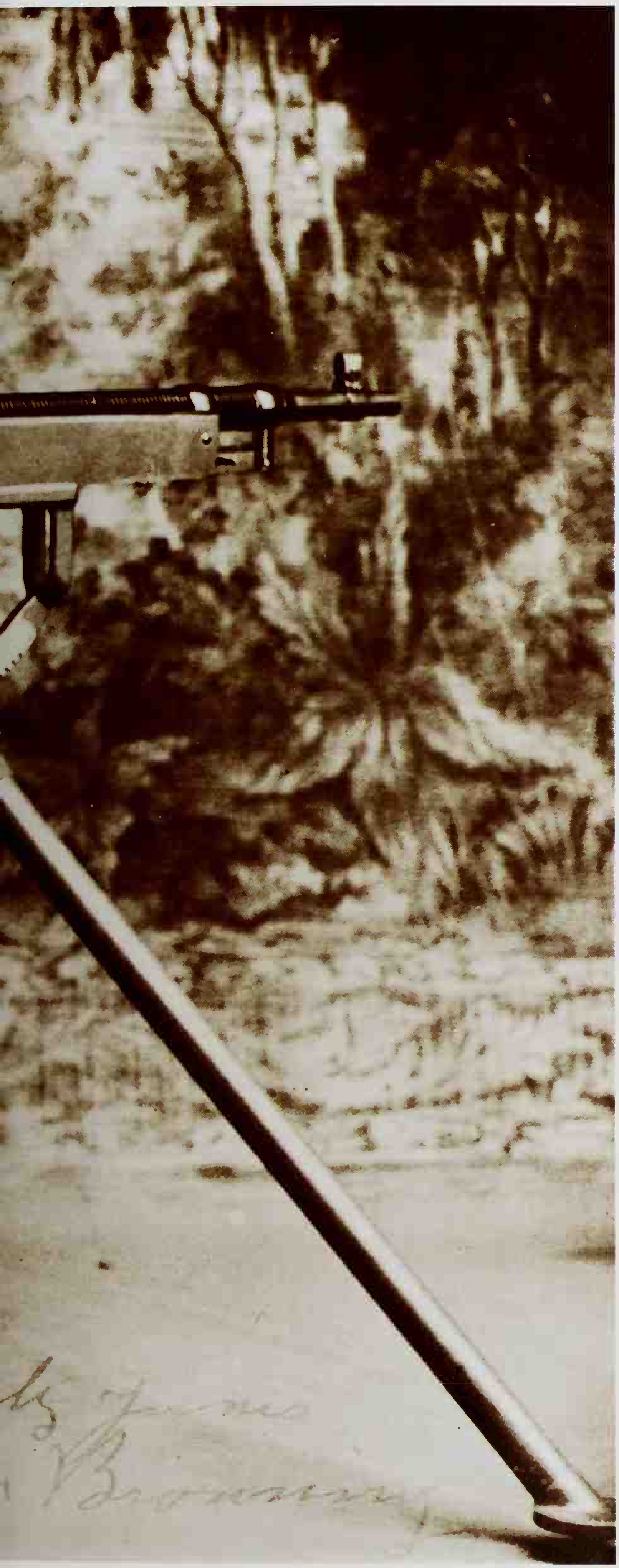
Model 1917 .30 Caliber





Left: A US military model of the Browning Model 1917.30 Caliber Water-Cooled Machine Gun. During World War I, Browning's son Val taught troops in France how to use this weapon. An air-cooled variant was developed later.

Sinc



The patent application on this gun was filed 8 December 1894, and US Patent Number 544,661 was granted on 20 August 1895. Because of its hand-forged parts and unfinished appearance, this experimental model is often erroneously assumed to be a very early Browning gas-operated gun.

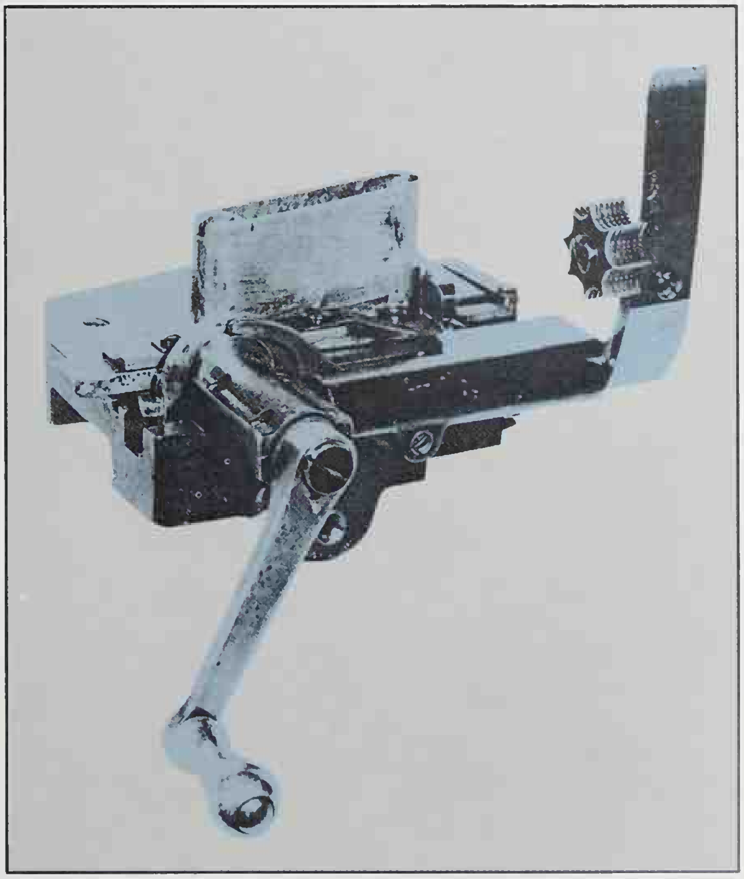
However, Browning's main purpose in designing it was to effect an improvement in the gas port, which, in all his prior machine guns (including the Colt Model 1895) had undergone little change. As stated in the patent, 'The objects of the invention being to avoid the fouling and clogging of the mechanism by the gases and to prevent the escape of the gases until after the lever shall have commenced its opening movement and received its initial force, and to prevent the lateral spread of the gases and to generally improve and simplify the construction of the gas operated mechanism.'

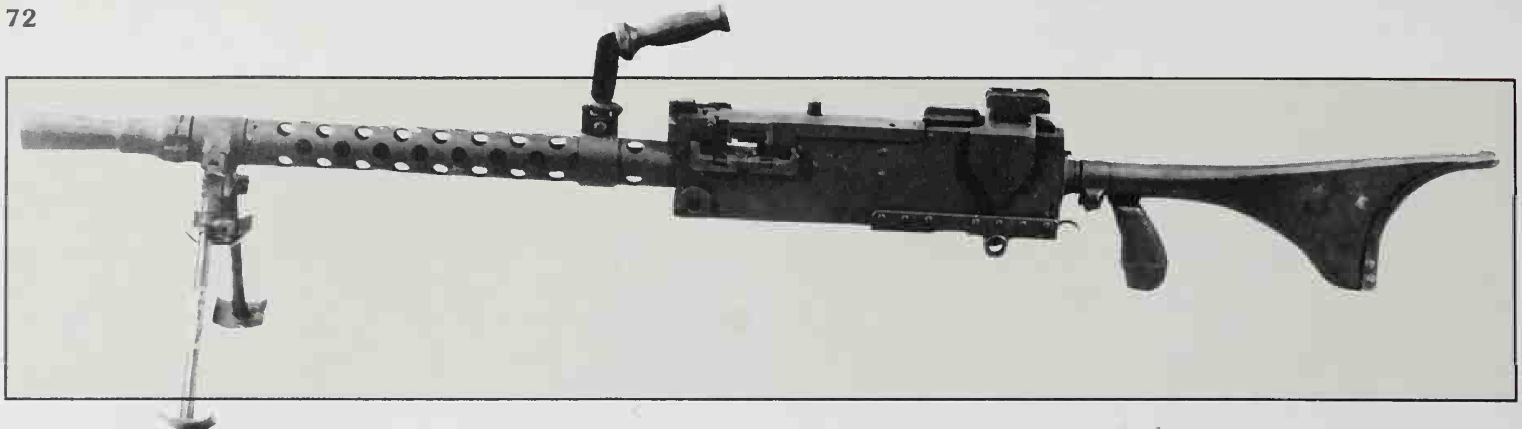
One very important idea that is present in this experimental gun centers on an alternate method of constructing the gas port. This method entails putting an elbow on the gas vent, so that the force of the gases are applied along the axis of the barrel—enabling the use of a piston to operate the mechanism rather than a swinging arm. This is an idea that has seen much usage since.

Model 1917 .30 Caliber Machine Gun (Colt, Remington, Westinghouse and Others). This is a short recoil-operated, water-cooled and later air-cooled, fully automatic machine gun in .30-06 caliber with a link belt magazine and a 20-inch barrel. Its cyclic rate of fire is 600 rounds per minute (with adjustments in later variants), and it weighs 37 pounds with its water jacket filled, and 22 pounds in air-cooled versions.

Versions of this gun have made history in World Wars I and II, and the Korean War. Until recently, it continued to

***Left:* John M Browning testing one of his machine guns. *Below:* A machine gunbelt loading device, one of Browning's miscellaneous inventions, designed in 1899 at the request of US Army Ordance.**





occupy a prominent place in the military arsenal of the United States. All this began back in 1900, when John M Browning invented a machine gun to replace the outdated Model 1895. The patent application for this new gun was filed on 19 June 1900, and US Patent Number 768,934 was granted on 23 July 1901.

Although sometimes referred to as the Browning Model 1901, the design of 1900 was never manufactured, since the government lacked interest in military weapons at the time. Nevertheless, its basic operating features are the same as those of all Browning machine guns since produced.

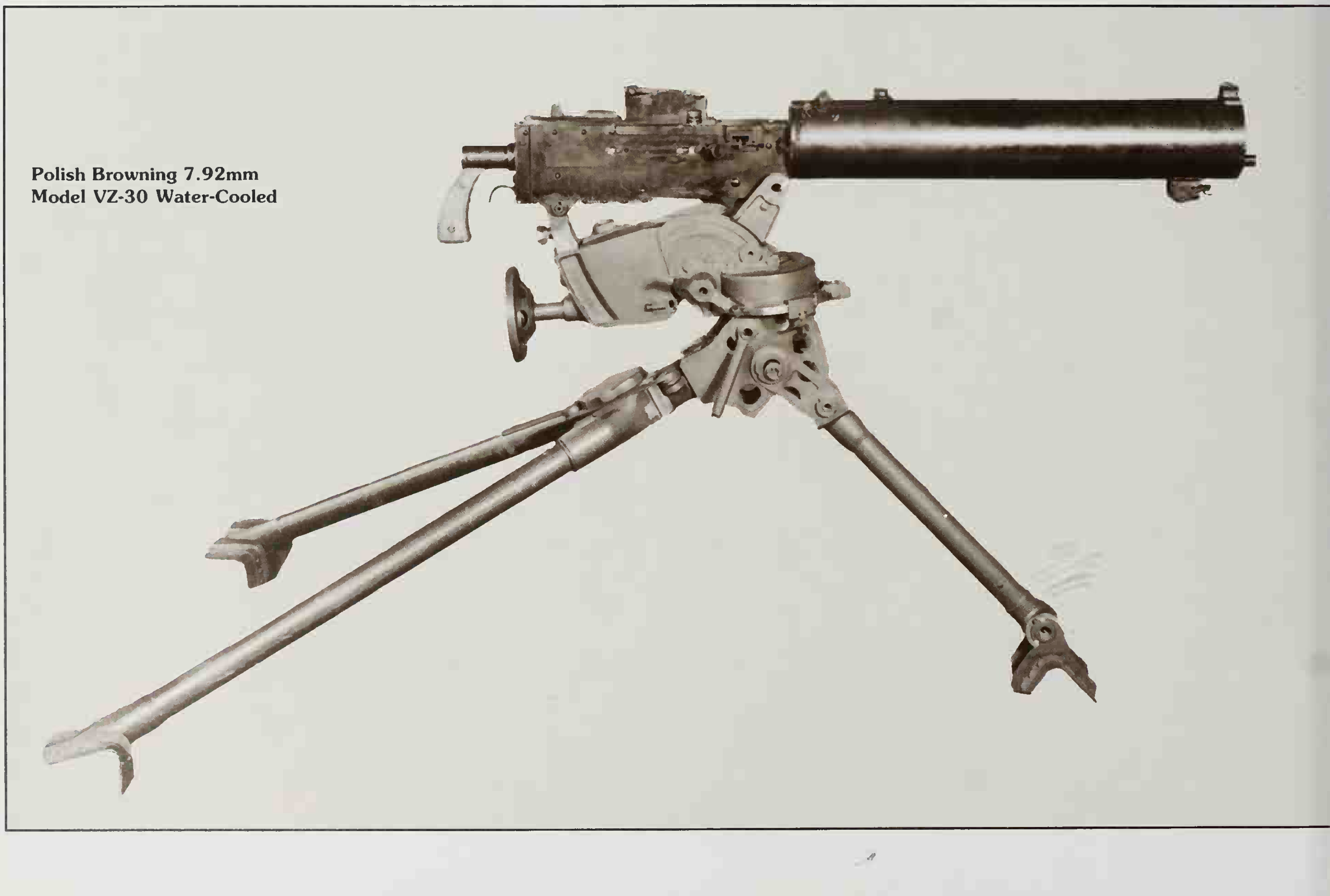
Browning continued working on the gun intermittently over the years, modifying its mechanism to eject from the bottom rather than the right side, and increasing its rate of fire. The patent application covering these improvements was filed on 3 October 1916, and US Patent Number 1,293,021 was granted on 4 February 1919.

The model embodying these changes—known as the Browning .30 Caliber Heavy Machine Gun—was first publicly demonstrated at Congress Heights, Washington, DC, on 27 February 1917. In May 1917, official tests were held at Springfield Armory. Following the tests, a board appointed by the US Secretary of War recommended its immediate adoption. The first combat use of the Model 1917 was by the 79th Division in France on 26 September 1918.

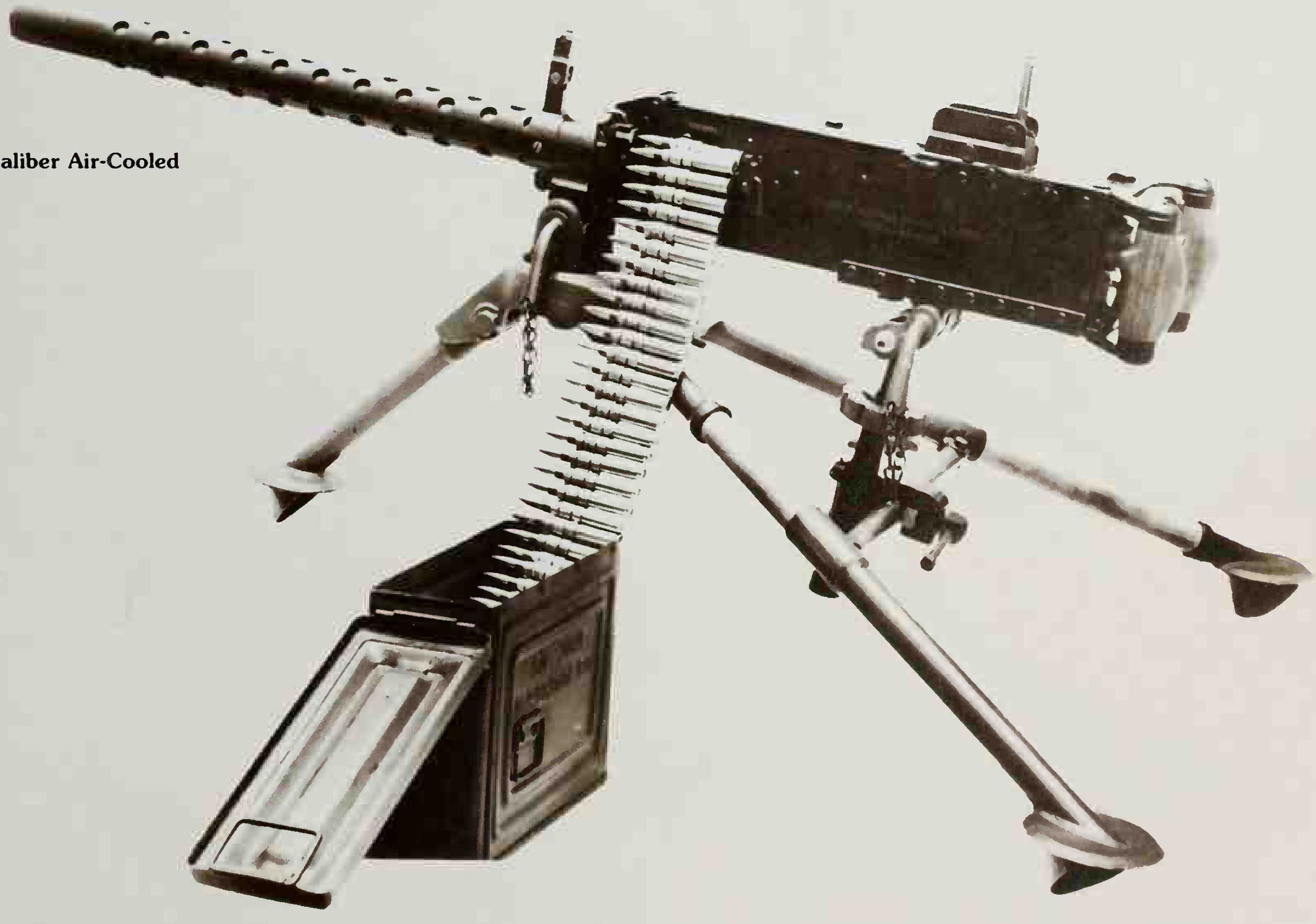
In the short-recoil system, the barrel and breechblock are locked together when the gun is fired and recoil together for a short distance, until the bullet clears the barrel and the gas pressure diminishes, at which point they unlock, and the breechblock alone continues to recoil. During this time, all this energy compresses the mechanism's springs, so that, as they become unsprung, the springs return all parts to their 'battery,' or firing positions. During the recoil of the breechblock, the fired cartridge is extracted from the barrel and ejected, and a fresh cartridge is fed into the chamber and fired. The firing cycle is continuous as long as the trigger is depressed and a supply of ammunition available.

This model was water-cooled, but Browning also made a later air-cooled variant. This air-cooled weapon was the first

***At top:* The .30 Caliber Air-Cooled Machine Gun was used by American forces during World War I, World War II and the Korean War. *Left:* US soldiers fire the same gun in combat during World War II.**

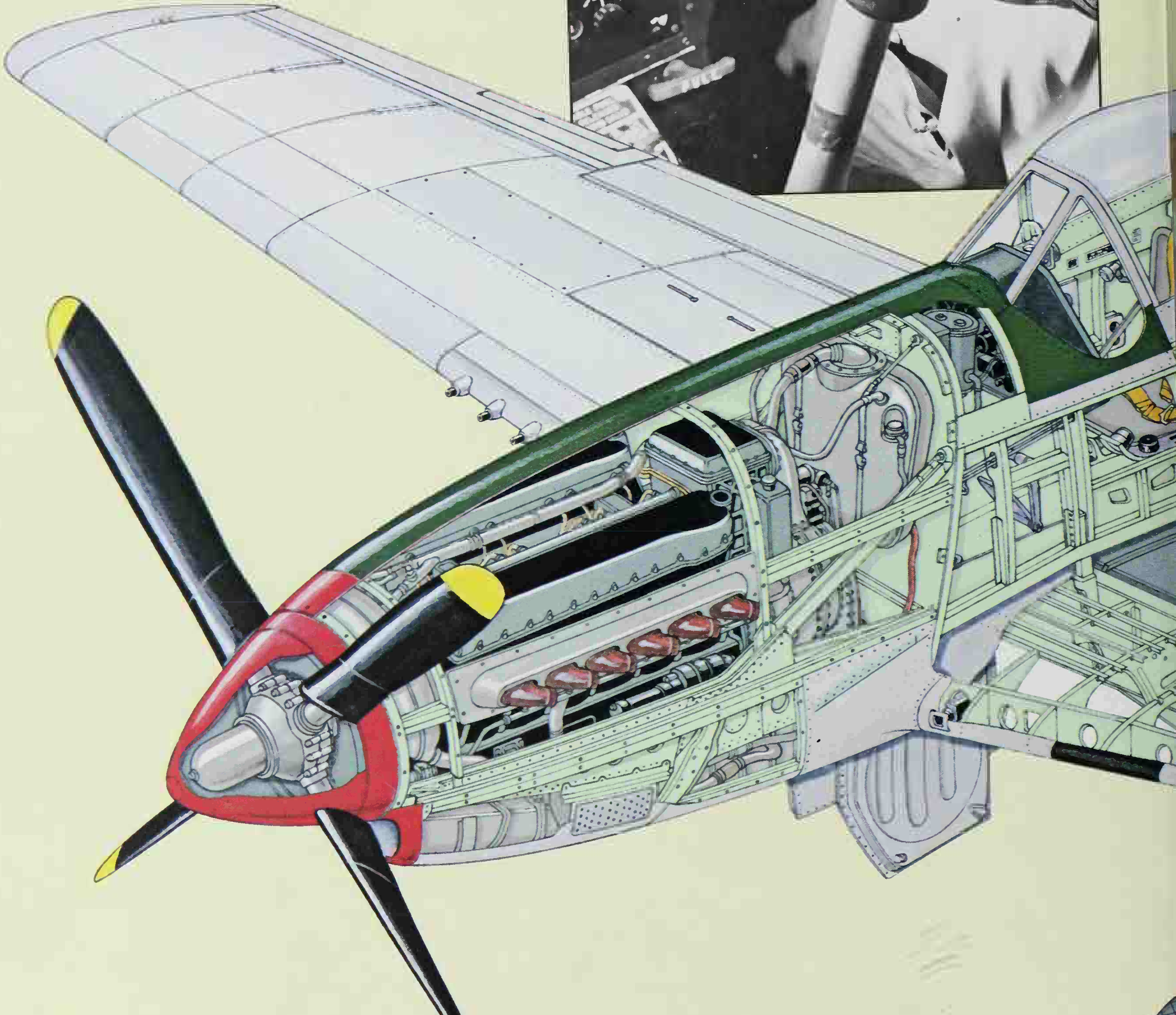


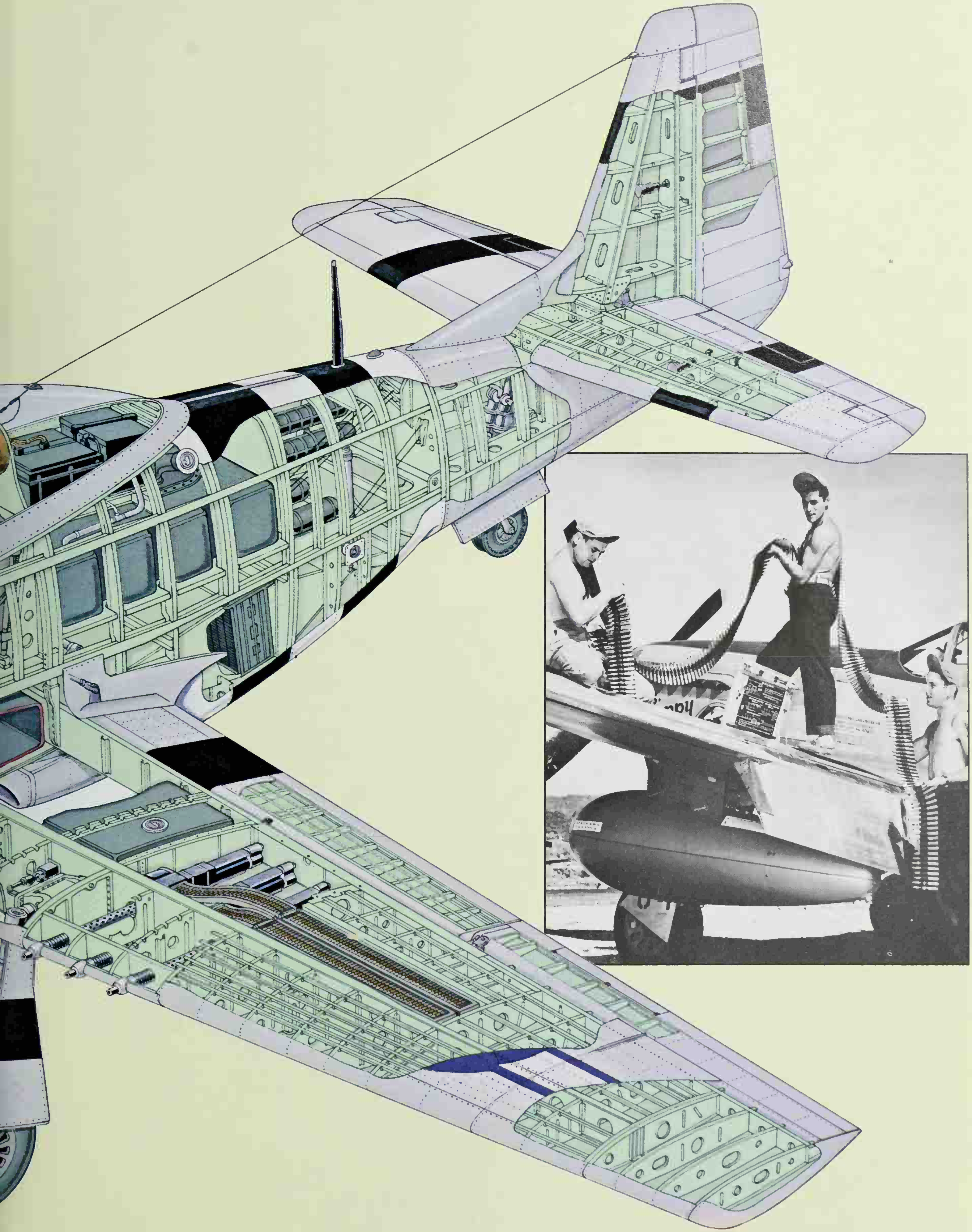
Polish Browning 7.92mm Model VZ-30 Water-Cooled

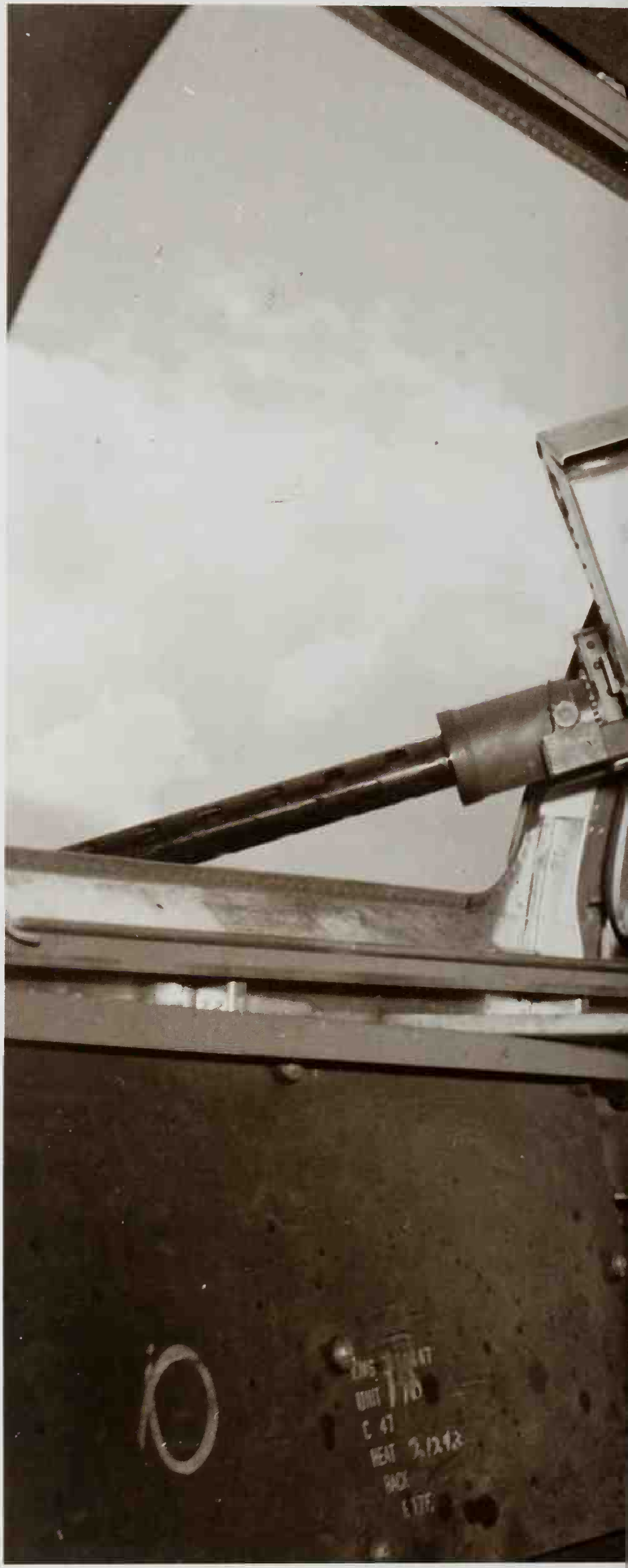


.30 Caliber Air-Cooled

Browning .50 caliber machine guns were standard armament for World War II Allied fighters like this P-51 Mustang *(below)*. *At right* is a section view of same, showing its control cockpit detail. *Far right:* Armorers of the 45th Fighter Squadron, 15th Fighter Group replenish a P-51's guns.







Above: **A Browning .50 caliber M2 on a halftrack in Rome 1944. Here it is being used for air defense.** ***Right:*** **A waist gunner aboard a B-17F at Bovington, England readies his weapon, a Browning .50 Caliber Machine Gun.**

in the US to be successfully used aboard pursuit planes—the pilot looked along his sights and aimed at the target by maneuvering his ship. To enable the use of a forward-mounted machine gun on a fighter plane without literally shooting one's own propeller off, the firing mechanism of the gun was synchronized with the motor of the plane so that the bullets passed through the spaces between the revolving propeller's blades.

The .30 caliber air-cooled Browning, in its diverse configurations, was one of America's most important military weapons in World War II. Many modified versions of this gun have appeared since its invention. It generally weighs approximately 22 pounds, and has an increased rate of fire of approximately 700 rounds per minute, although some aircraft models were stepped up to as high as 1300 rounds per minute for duty in the superheated skies of the 1940s and early 1950s.

The US Government contracted with three companies for World War I production of the Model 1917. Between its official adoption in 1917 and the Armistice of the following year, nearly 43,000 were produced: Westinghouse accounted for 30,150, Remington, 12,000 and Colt 600. Over a million units of the World War II Browning .30M2 were manufactured. Most countries have since acquired similar weapons. Total production can only be estimated as well into the millions.

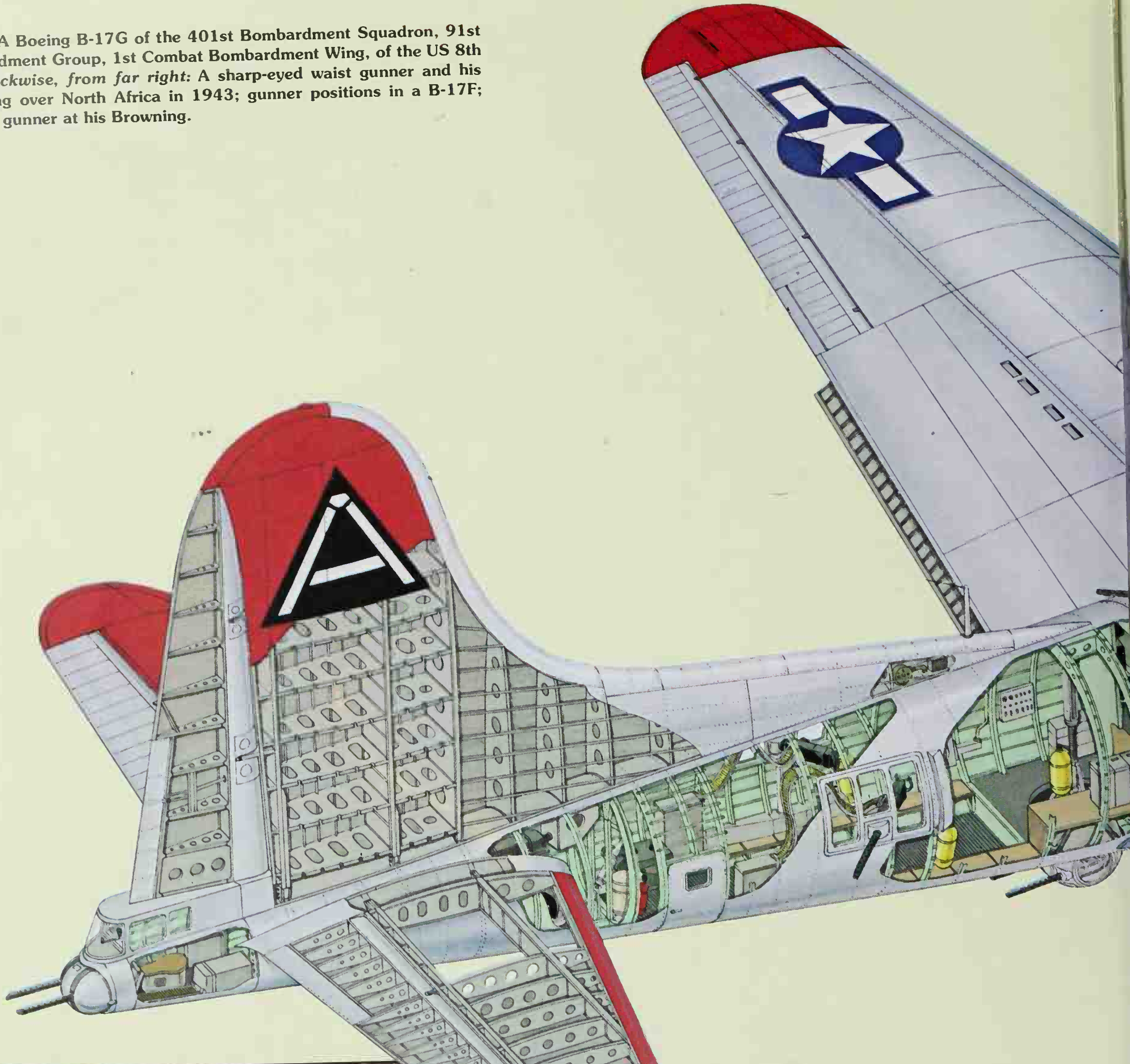
Browning Water-Cooled Machine Gun in .50 Caliber (Colt and others). This is a short recoil-operated, water-cooled and later air-cooled, machine gun in .50 caliber with a link belt magazine and a 39-inch barrel. This weapon weighs 82 pounds with a full water jacket—air-cooled variants weigh less.

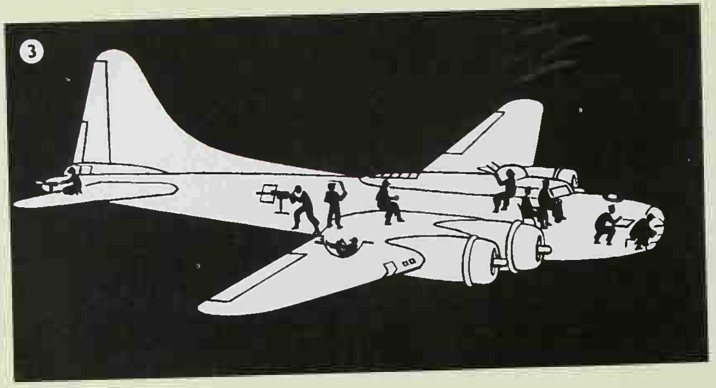
To meet the increased threat of armored combat vehicles in World War I, General John 'Blackjack' Pershing, Commander of the American Expeditionary Forces, requested a machine gun cartridge that was heavier and more powerful than the .30 caliber cartridge then in use by the AEF.

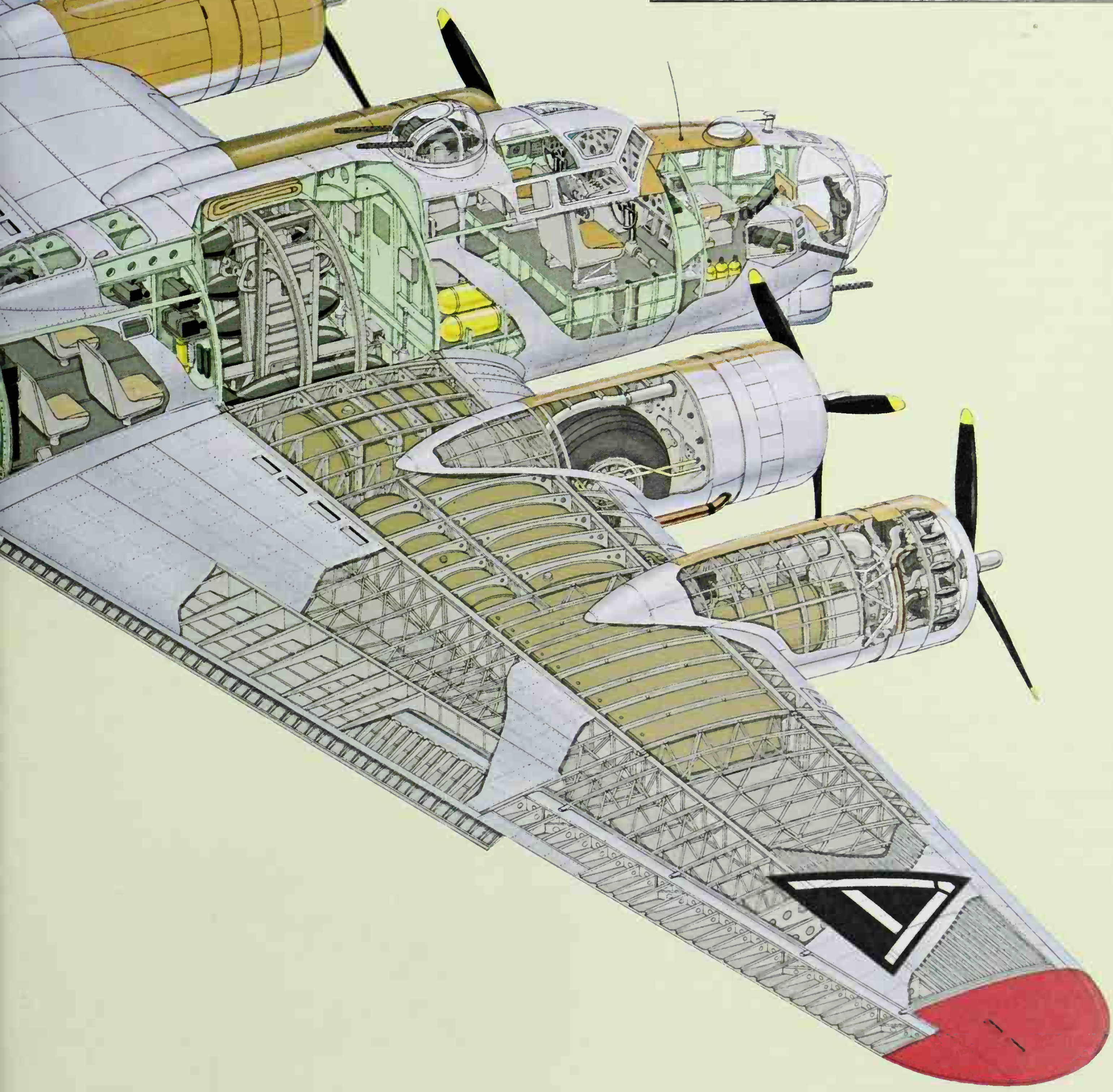
A .50-caliber cartridge was developed—it hurled a 1.8 ounce bullet to a muzzle velocity of 2750 feet per second. To shoot this powerful load, John M Browning developed

LEFT HAND

Below: A Boeing B-17G of the 401st Bombardment Squadron, 91st Bombardment Group, 1st Combat Bombardment Wing, of the US 8th AF. *Clockwise, from far right:* A sharp-eyed waist gunner and his Browning over North Africa in 1943; gunner positions in a B-17F; another gunner at his Browning.







the Browning .50 Caliber Water-Cooled Machine Gun. He began work in July of 1917, and the gun was first test-fired, in Colt's meadow in Hartford, Connecticut, a little over a year later. The patent application for the gun was filed on 31 July 1923, and US Patent Number 1,628,226 was granted on 10 May 1927.

Developed too late to see use in World War I, the Browning .50-Caliber Machine Gun played a prominent role in World War II and the Korean War. This gun has the same basic operating features as the .30 caliber, but through the use of a unique oil buffer the necessary strengthening of the gun is accomplished without a proportional increase in weight. The oil buffer absorbs excess recoil energy, thereby effectively reducing undue strain on the parts. In addition, this oil buffer provides a means of controlling the rate of fire.

Browning also incorporated double spade grips on the .50 caliber, as these gave a two-handed—and thus more stable—control of the gun than did the pistol grip used on the smaller .30 caliber. To date, no less than 66 known models of the Browning recoil-operated machine gun have been manufactured by the US and various Allied countries. The majority of these have been .50 caliber.Other highly effective models which followed the original prototype were the Water-Cooled Infantry, the Water-Cooled Anti-Aircraft Single and Twin Mount, and the Air-Cooled Tank Gun. One of the later aircraft models, the .50M3, was stepped up to a cyclic rate of fire of 1200 rounds per minute.

During World War II, the .50M2 was produced by the following companies: Colt's Patent Firearms Manufacturing Company, High Standard Company, Savage Arms Corporation, Buffalo Arms Corporation, Frigidaire, AC Spark Plug, Brown-Lipe-Chappin, Saginaw Division of General Motors Corporation and Kelsey-Hayes Wheel Company. Of the 3,283,837 Browning machine guns produced in this country during World War II, approximately two million were .50 calibers. Like the Browning .30 caliber, this gun has been widely copied by other countries, and total production can only be estimated as well into the millions.

Necessarily, not all of John M Browning's machine gun and fully automatic weapon mechanisms can be covered here—nor can the work of such important modifiers of original Browning designs as Fred Moore and Colonel S Gordon Green. For those seeking further information, please consult *Volume One of The Machine Gun: History, Evolution and Development of Manual, Automatic and Airborne Repeating Weapons,* by George M Chinn, Lt Col, USMC Retired, published by the Superintendent of Documents, Washington, DC.

John M Browning's Aircraft Cannon

Browning 37mm Aircraft Cannon (Colt, Vickers and others). This is a long recoil-operated aircraft cannon of 37mm caliber with a barrel length of 44 inches and a cyclic rate of fire of 135 rounds per minute. This cannon weighs approximately 313 pounds without magazine attached, and approximately 406 pounds with a 15-shot magazine attached. These specifications are based on the M4 model.

John M Browning began work on his first aircraft cannon in early 1921; three months later, it was successfully test-fired in the hills outside of Ogden. The patent applications for this gun were filed on 15 December 1923, 11 April 1924 and 28 April 1924, and US Patent Numbers 1,525,065—67 were granted on 3 February 1925.

The cannon was successfully demonstrated to US Army officials at the Aberdeen Proving Ground in mid-1921, when it fired a series of one-pound projectiles at a muzzle velocity of 1400 feet per second, and a cyclical rate of 150 rounds per minute. Shortly after, Browning designed two additional models, each firing heavier projectiles—the first at 2000 feet per second, and the second at approximately 3000 feet per second.

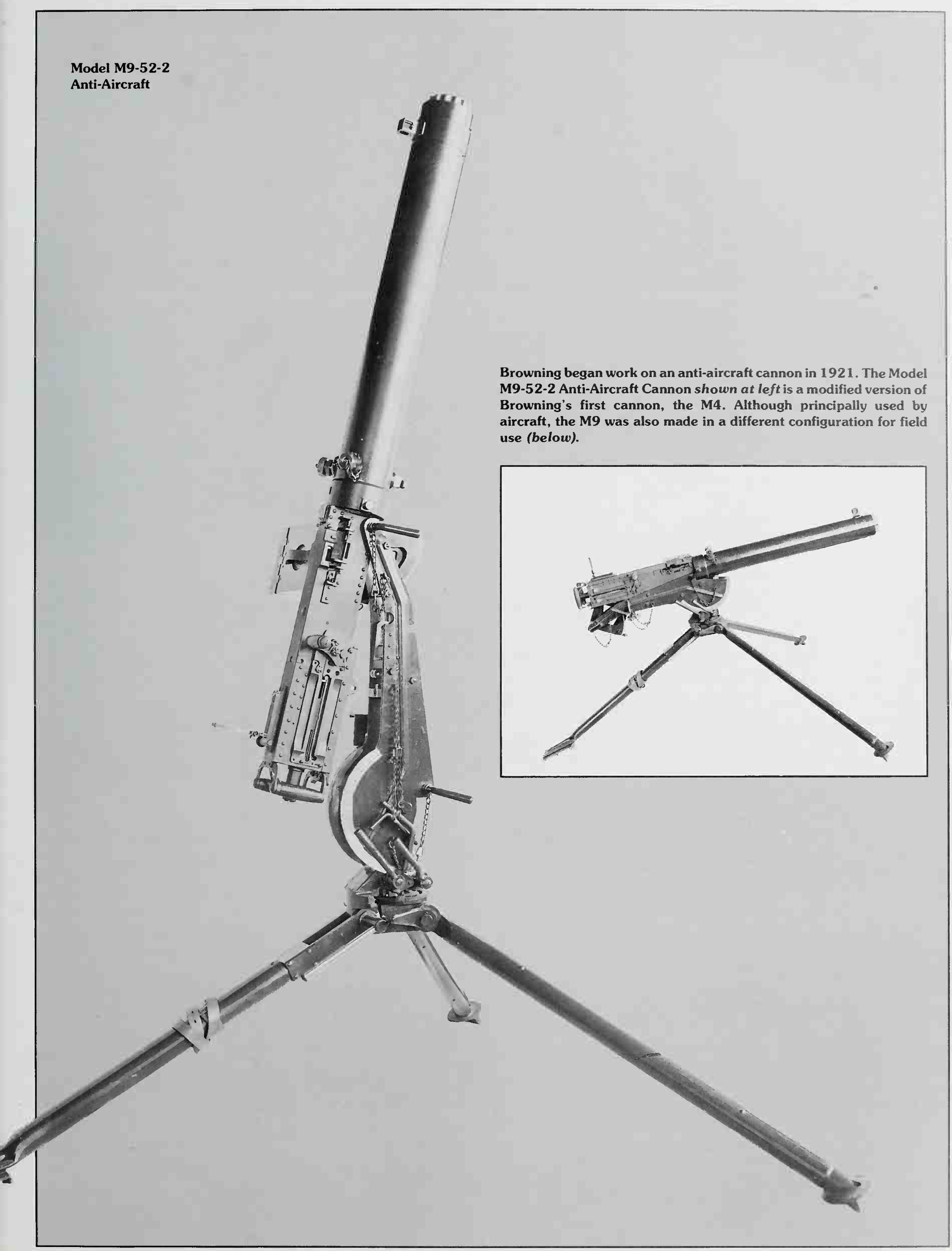
In 1929, a small number of these weapons were manufactured by the Vickers Arms Company in England for sale to Spain. The US Government, for a time apathetic to the production of new military weapons, did not renew interest in the gun until 1935, when the Army Air Corps model of Browning's cannon was produced by request. This cannon was entered on the ordnance lists as the M4.

The World War II model, the M9, was used in rather limited quantities by the US Army Air Corps, which eventually decided that such heavy armament was neither practical nor essential. This cannon did, however, see much use in the hands of the Russians. During their most critical defensive combat with Germany, the M9 was their primary aerial cannon. Several thousand of these guns—and the P-39 Bell Aircobra planes on which they were mounted—had been sent to Russia by the US Government. The M9s' high-velocity, armor-piercing projectiles proved to be quite effective against German tanks.

The basis of the long-recoil principle is that both recoil and counter-recoil are controlled by a hydro-spring buffing mechanism. The breechblock is of the vertical, sliding-wedge type. When the projectile is fired and driven down the bore of the barrel, the barrel, breechblock, and locking frame, all locked together, recoil rearward 10 inches before the breechblock cams downward, cocking the hammer, ejecting the empty case, and loading a new shell—at which point, the mechanism locks up and is again ready for firing.

The M9 was principally intended for use by aircraft. It is either mounted to fire through the hub of the propeller or from the wings. With little change, it can be fed from either right or left. The muzzle velocity of its standard round is 3050 feet per second. The total production of all Browning Aircraft Cannons, including World War II, is under 100,000 units.

The United States Government sent several thousand P-39 Bell Aircobra planes mounted with Browning M9s to Russia. With their armor-piercing projectiles, the M9s were a crucial element in the Russians' aerial battles against the Germans. *Above:* A Bell P39D-1 in flight.



Model M9-52-2
Anti-Aircraft

Browning began work on an anti-aircraft cannon in 1921. The Model M9-52-2 Anti-Aircraft Cannon *shown at left* is a modified version of Browning's first cannon, the M4. Although principally used by aircraft, the M9 was also made in a different configuration for field use *(below).*

Fabrique

The History

It is quite natural that firearms enthusiasts throughout the world should regard Liège, Belgium as their capital; it has been steeped in gunmaking tradition for nearly six centuries. Indeed, Fabrique Nationale, the historical heir of a firearm manufacturing tradition dating from the fourteenth century has its home in the suburbs of this gracious city of the Meuse Valley.

Way back in the 1500s, metal workers grouped under the name of 'Bon Metier Des Febvres' (the 'Good Guild of Metal Workers') had a central role in the industrial and economic life of Liège. These men were totally dedicated to the manufacturing of guns and military weapons, and to the making of the highest quality gunpowder and projectiles.

In this same era, the Princes-Evaques managed to maintain the Principality of Liège in a state of political neutrality, and made the city's fortune by promoting its weapons to a number of warring neighbor-states.

In the seventeenth century the talent of metal workers from Liège came to be recognized throughout Europe. During this period a Swedish a banker named Louis de Geer financed a dozen iron mills, nail works, gun foundries and arms factories. Many of the workers at these various facilities were workers from the Principality of Liège.

At the Court of the French King Louis XIV, richly adorned firearms were in vogue, and the ability to create a finely-crafted, expensively ornate firearm had become prized as one of the highest arts—and was rewarded richly by the extravagant French royalty. Therefore attracted to the French Court, the great master armorers of the time left their own countries and settled in northwestern France. And from Liège came Adrien Reynier, who became the personal gunsmith to Louis XIV. The guns and pistols of Reynier and his fellow countrymen became renowned as masterpieces of classical arm manufacturing.

In 1672, a proclamation was issued in Liège that required arms makers to have their products tested and hallmarked. Fabrique Nationale's concern for quality and perfection therefore has its roots in that long-ago proclamation, and it is still a source of pride that every FN firearm is thoroughly proven to a very high standard of excellence.

In the eighteenth century, the export of firearms was an ever-increasing source of prosperity for Liège. By 1750, annual firearms production in Liège had reached 100,000 weapons. By 1788, the 70 to 80 arms manufacturers in Liège were exporting more than 200,000 weapons annually at a value of three or four million guilders. And the quality of even the lowest-grade firearms was steadily improving, for, due to the quality demands made by the European aristocracy, increasingly sophisticated firearms manufacturing techniques were steadily being invented. The French Revolution and its aftermath were disastrous for the gunmakers of Liège, and the number of active workshops soon fell to 14, and the government Proof House, where final inspection of firearms took place, fell into disuse. Since French royalty no longer existed, the demand for extremely high-quality firearms had dropped to almost nil. Most orders were now for only the most utilitarian of weapons.

In 1810, an imperial decree reestablished the Proof House, and at about that same time, innovation began to trickle back into the shops, for a production line was set up whereby separately machined parts could be fully assembled after only very small adjustments.

Under the government of Napoleon Bonaparte, tastes in firearms once again turned toward the higher grades, and

In 1984, Browning introduced the Classic and Gold Classic series to commemorate three of John Browning's greatest inventions. *Right, from top to bottom:* The Classic Automatic-5 Shotgun, the Classic Over & Under Shotgun and the Classic 9mm Hi-Power Pistol.

Nationale

BROWNING
CLASSIC
BROWNING
CLASSIC
EXPRESS

technical improvements became the watch word of the day. More than ever before, the gunmakers of Liège were asked to make vast quantities of arms for their Parisian customers.

The 19th century may be called the Golden Age of gunsmithing in Liège, and was marked by significant advances in the craft. A whole range of inventions had contributed to revolutionizing the design and the manufacture of military firearms. In particular, many of these inventions were derived from the percussion-cap principle that was patented by Alexander Forsyth in 1807.

Heretofore, ignition of the powder charge in a firearm was effected by one of several methods—all of which had their own mechanism of application—the wick, or 'match'; the spark-generating friction wheel; and the spark-striking chip of flint. A percussion cap is a small brass or copper cup that contains a small amount of fulminate of mercury, which explodes when struck by a blow. The percussion cap rests on a nipple which is tapped into the the breech of the gun. When it is struck by the firearm's hammer, the charge in the cap expends its energy through the hole in the nipple, igniting the powder charge in the gun's chamber. This was so much more efficient than the wheellock, flintlock or matchlock that its acceptance was rapid and widespread.

Soon enough, experiments with self-contained cartridges of various types resulted in cardboard cartridges made for guns with long, needle-like firing pins. These were inefficient, as the cartridges tended to swell and stick in the chamber. At about the same time, the idea of using paper cartridges in conjunction with percussion caps was leading to the design of many of the weapons that were used in the American Civil War. Shortly after this, however, the percussion cap was made an integral part of a limited-expansion brass cartridge, and the basic mechanism of the modern firearm was formed around this combination.

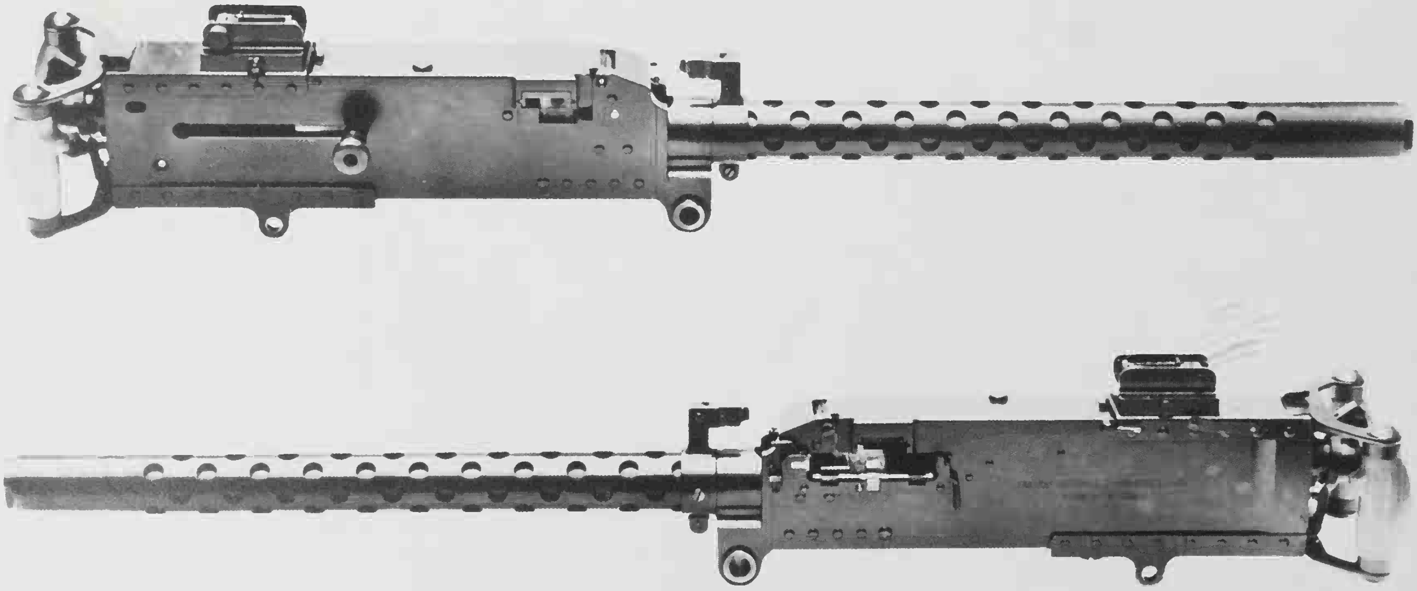
The progress that was made in the development of the modern cartridge also led to the development of firearms able to fire a varying number of shots. So it was that Collier's revolver appeared in about 1820; and 1835 saw the invention of Colt's revolver; Spencer's repeating rifle appeared in 1860 and Mauser's rifle appeared in 1864. These were followed by the automatic weapons inventions of the late 1880s and early 1890s. Liège's manufacturers adopted these various improvements as soon as they were introduced. In 1870, an idea which later would lead to the creation of Fabrique Nationale began to take shape. Fearing foreign competition, some manufacturers decided to unite. First they established a communal workshop—which was known as the 'Petit Syndicat,' or 'Little Syndicate'—where they made guns for the Belgian Guard.

In 1886, a partnership grouped seven manufacturers under the name of 'Les Fabricants d'Armes Reunis,' or 'The United Arms Makers.' In 1888, following an order for 150,000 repeating rifles from the Belgian Government, the Fabricants d'Armes Reunis, needing help to fulfill the order, induced their direct competitors to become their partners for the sake of fulfilling the government order. Strictly for that purpose, a limited company—actually, more of a coalition—was formed.

The name of the new Company was chosen on 8 December 1888, and it was 'Fabrique Nationale d'Armes de Guerre.' On 1 February 1890, a plot of land was purchased in the territory of Herstal, a commune lying near Liège. Today, the main workshops of Fabrique Nationale Herstal (as the firm is now formally known) firearms division are located on that very plot of ground.

The 'coalition' worked so well that the arms makers decided to keep it going. At the end of the nineteenth century, FN was exploring two new fields: the manufacturing of dual-purpose guns that could be used for both game and target shooting, and the making of bicycles. In 1896 the company board of directors approved the manufacturing of 50,000 .22 caliber sporting rifles, and in 1898, the company invented a bicycle without a chain, the so-called chainless bicycle, a version of which was immediately put into production.

Fabrique Nationale Air-Cooled Machine Gun



The Browning Era

In 1897, FN's Board of Directors sent its commercial director to the United States to obtain information about the latest improvements in bicycles. During his time in the US, he became acquainted with John Moses Browning and Matthew Browning. John had just applied for a patent covering his Automatic Pistol in .32 Caliber.

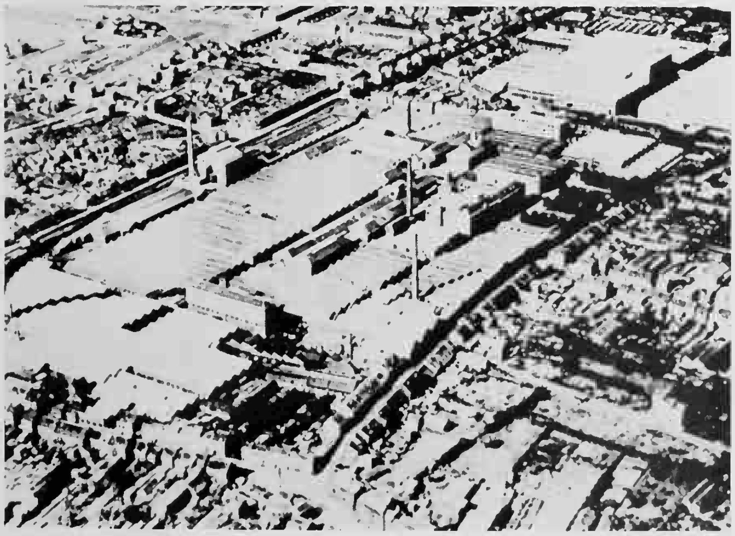
Browning offered the license for this pistol to FN who, upon accepting the offer, produced the first pistols of this type in 1899. The superiority of this weapon was soon widely recognized, and in 1900 it was adopted as an official sidearm for the Belgian Army Corps. This was an historic moment—it was the first time that an automatic pistol was accepted into the equipment roster of any nation's regular army.

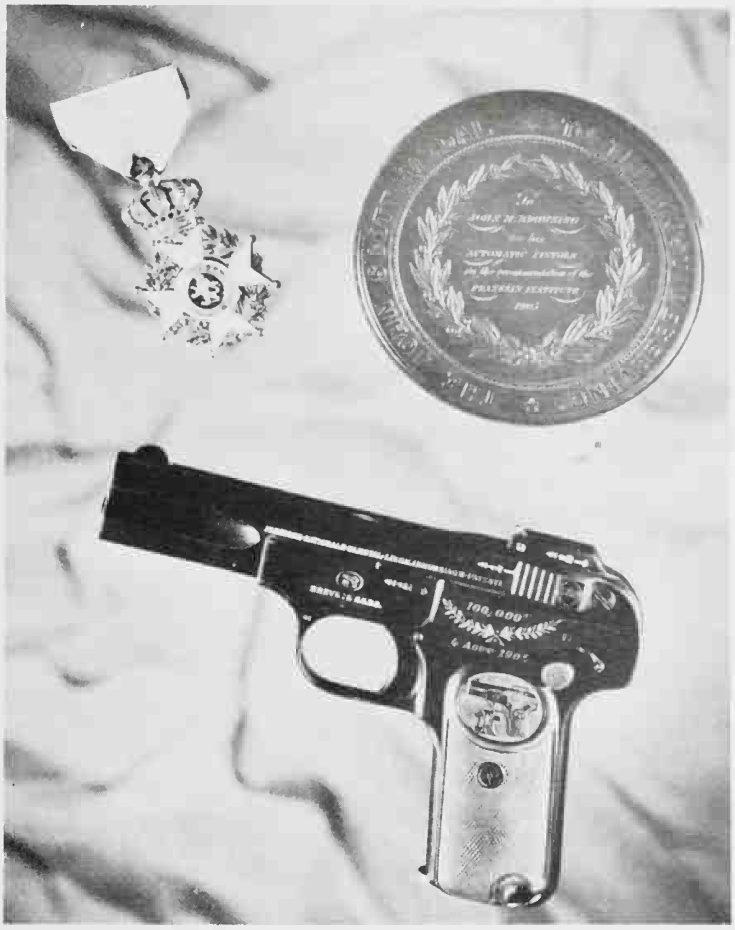
This was just the beginning of a long and fruitful relationship. In 1902 John M Browning arrived in Herstal with the prototype of an automatic shotgun that he had previously offered, in vain, to American manufacturers. Since FN had had little success in the hunting firearms market, and especially since the .32 semiautomatic had gone over so well, the firm took an immediate interest in this weapon, and a license contract was signed. On the same day, Browning ordered 10,000 shotguns from this license, for sale under his own newly-created 'Browning Firearms Company.'

Since then, FN has manufactured about three million automatic shotguns. The substance of the relationship still maintained by FN with the Browning Company is exemplified in that long-ago agreement. Shortly after selling them the automatic shotgun license, John M Browning acceded to FN's wishes to use his name as a trademark. By granting FN the right to do so, he sealed the consolidation of interests which has, ever since, united the Browning Arms Company and Fabrique National.

As time goes on, one can judge the considerable and far-reaching consequences of that agreement. Now the FN-Browning brand name which is engraved on each firearm that is produced in by the united companies is an assurance, to shooters throughout the world, of perfection in gunmaking.

That maker's mark represents the linking of the centuries-old tradition of Liège's armorers with the inventive genius of the Browning family. Today, FN actually owns the Browning Arms Company, of which Browning Arms North America is an independent subsidiary. The tradition, firmly unified, continues.



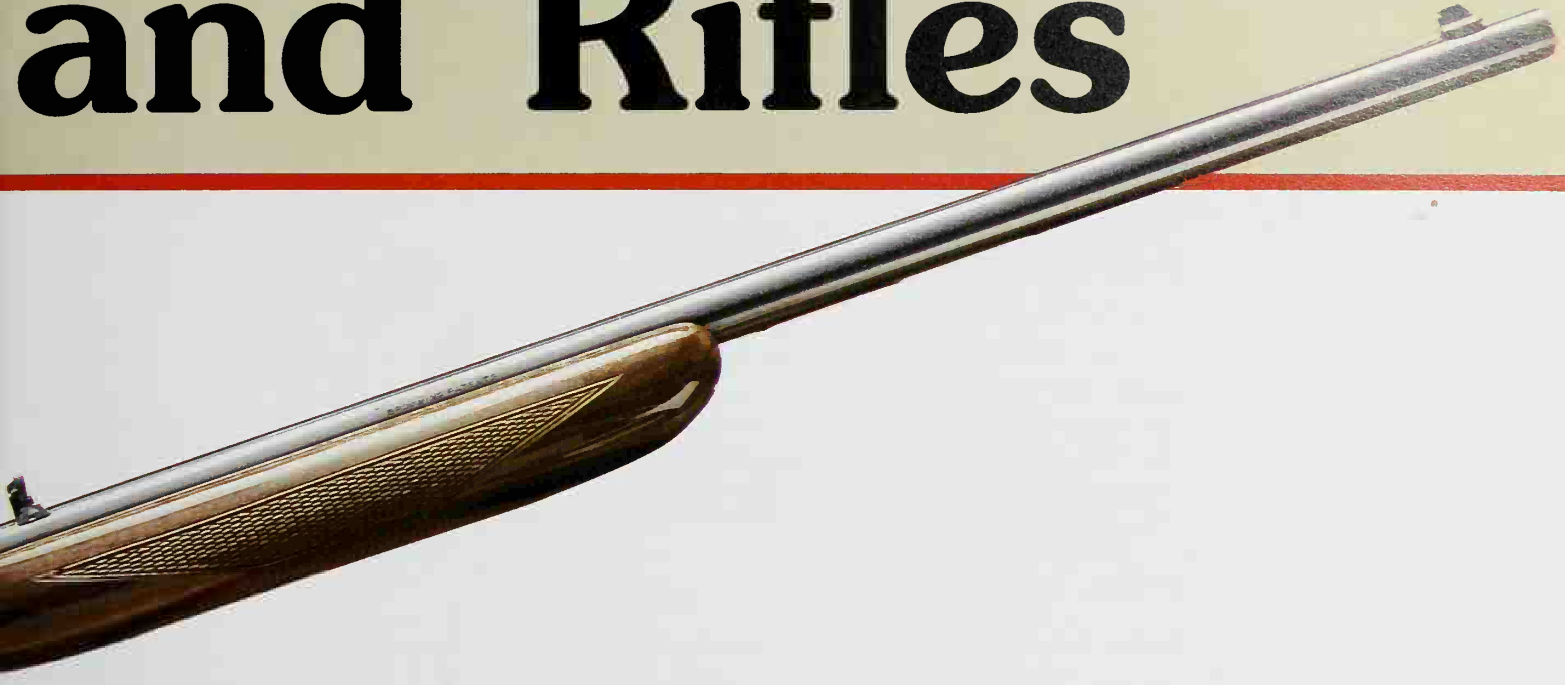


***Above, clockwise from upper left:* Browning's awards—The Cross of Knighthood of the Order of Leopold, The John Scott Legacy Medal and the gold-inlaid 100,000th FN Model 1900. *Left:* The Liège shop, where engravers like the one *below* ply their trade.**

Newer Pistols

Above: This 22 Semi-Auto is a modern example of John M Browning's unique design for the .22 caliber automatic rifle. *Right:* The author, KD Kirkland, during a tour of the Browning factory in Utah.

Browning and Rifles



Browning Pistols

The following major modern Browning pistols have been manufactured for the Browning Company of Morgan, Utah by Fabrique Nationale d'Armes de Guerre (now Fabrique Nationale Herstal) of Herstal, Belgium; Arms Technology Inc of Salt Lake City, Utah; and by JP Sauer & Sohn of Eckenforde, West Germany. Many of these are either updates of or follow-ons to, original John M Browning designs.

Browning .25 Caliber Automatic Pistol. This is a blowback-operated semiautomatic pistol in .25 ACP and 6.35mm Browning caliber, with a six-shot pistol-grip magazine and a 2.1-inch barrel. This pistol weighs approximately seven ounces, and has standard hard rubber grips, with optional Nacrolac pearl grips having been available. It was manufactured from 1955 to 1969, and is based on the John M Browning design.

Browning .380 Caliber Automatic Pistol. This is a blowback operated, hammerless, semiautomatic pistol in .380 ACP caliber, with a six-shot pistol grip magazine. This pistol has two main variants, the 1955 model and the 1971 model—the former is equipped with fixed sights and a four-inch barrel, and the latter is equipped with adjustable rear/fixed front sights and a 4.4-inch barrel. The 1971 models have plastic thumbrest stocks. The earlier variants weigh 1.3 pounds, and the later variants weigh 1.4 pounds. Production on the 1955 model ended in 1969, and production on the 1971 model ended in 1975. This is essentially an update of the original John M Browning design.

Browning Hi-Power 9mm Automatic Pistol. This is a short recoil-operated, locked breech, semiautomatic pistol in 9mm Parabellum caliber, with a 13-shot pistol grip magazine and blade front/fixed rear sights (optional adjustable rear/ramp front sights are available). This pistol has a 4.6-inch barrel and weighs 2.2 pounds. The grips are checkered walnut or Nacrolac pearl. This pistol has been manufactured from 1955 to date, and is essentially an update of the original production model of the John M Browning design.

Browning Nomad Automatic Pistol. This is a semiautomatic pistol in .22 long rifle caliber, with a pistol grip 10-shot magazine, and barrel lengths of 4.5 and 6.8 inches, with removable blade front/adjustable rear sights. This pistol weighs 2.1 pounds with the 4.5-inch barrel. Plastic stocks are standard on this pistol, which was made from from 1962 to 1974.

Browning Challenger Automatic Pistol. This is a semiautomatic pistol in .22 long rifle, with a ten-shot pistol grip magazine, and removable blade front/adjustable rear sights. Barrel lengths for this pistol range from 4.5 to 6.8 inches, and weighs 2.4 pounds with the latter barrel. This pistol has standard checkered walnut stocks, with finely figured and carved stocks on extra-fine Gold and Renaissance Models. The Challenger was manufactured from 1962 to 1975.

Browning Medalist Automatic Target Pistol. This is a semiautomatic pistol in .22 long rifle caliber, having a 10-shot magazine. Its 6.8-inch barrel has a ventilated rib, and removable blade front/click-adjustable mocrometer rear sights. The pistol weighs 2.9 pounds, and was made from 1962 to 1975.

Browning BDA Double Action Automatic Pistol. This is a locked breech, double action, semiautomatic pistol in 9mm Luger, .38 Super Auto and .45 ACP with a seven to nine-shot magazine (depending on caliber used) and a 4.4-inch barrel. This pistol weighs 1.8 pounds, has fixed sights and plastic grips, and was introduced in 1977.

Browning Rifles

The following are major modern Browning rifles that have been manufactured for Browning of Morgan, Utah, by Fabrique Nationale d'Armes de Guerre (now Fabrique Nationale Herstal) of Herstal, Belgium; Miroku Firearms Mfg Co of Tokyo, Japan; and Oy Sako Ab of Riihimaki, Finland. Many of these are either updates of, or follow-ons to, original John M Browning designs.

Browning .22 Automatic Rifle. This is an autoloading rifle in .22 short and long rifle caliber, with a 15 (short) or 10 (long rifle)-shot tubular magzine in the buttstock and a 19.3 to 24-inch barrel. It weighs approximately five pounds, has open rear/bead front sights and pistol-grip style checkered stock. This rifle has been made from 1965 to date.

Browning High-Power Bolt Action Rifle. This is a bolt action rifle in .270 Winchester, .30-06, 7mm Remington Magnum, .300 H&H Magnum, .300 Winchester Magnum, .308 Norma Magnum, .338 Winchester Magnum, .375 H&H Magnum and .458 Winchester Magnum calibers, with a four to six shot (depending on caliber) magazine and adjustable sights and barrel lengths from 22 to 24 inches. The stock is standard with checkering and pistol grip, Monte Carlo cheekpiece, sling swivels and recoil pad on magnum models.This rifle was made from 1959 to 1974.

Browning High-Power Bolt Action Rifle, Short Action. This is a bolt action rifle (featuring a shortened, light-caliber only version of the standard bolt action) in .222 Remington and .222 Remington Magnum calibers, with a six shot magazine and a 22 to 24-inch barrel, and no factory sights included. This rifle was made from 1963 to 1974.

Browning High-Power Bolt Action Rifle, Medium Action. This is a bolt action rifle (featuring an intermediate-caliber action) in .22-250, .243 Winchester, .264 Winchester Magnum, .284 Winchester Magnum and .308 Winchester calibers, with barrel lengths that range from 22 to 24 inches. This rifle was made from 1963 to 1974.

Browning T-Bolt .22 Repeating Rifle, T-1. This is a straight-pull bolt action rifle in .22 long rifle caliber, with a five-shot clip magazine and peep rear/ramp front sights. It has a 24-inch barrel, weighs six pounds and has a plain

BAR Big Game Limited Edition

Grade I BAR with Open Sights

Limited Edition Pronghorn Issue

A-Bolt 22 Grade I with Open Sights

A-Bolt Cameo Stalker

A-Bolt Medallion Left Hand Version

9mm Hi-Power with Adjustable Sights

Buck Mark .22 Silhouette

Buck Mark .22 Varmint

BDA 380 Nickel Finish

BDA 380 Blued Finish

The Browning Automatic Rifle was US standard military issue in the two World Wars and the Korean War and is now made for civilian use in .270 Winchester to .30-06 calibers. Not only do these guns live up to their reputation for reliability and dependability, they also make a handsome addition to any collection. *From top to bottom:* BAR Big Game Series Limited Edition, Grade IV, Grade III and Grade I.

walnut stock with pistol grip. Also available in a left hand model, it was made from 1965 to 1974.

Browning BAR Automatic Rifle. This is a gas-operated semiautomatic rifle in .243 Winchester, .270 Winchester, .308 Winchester and .30-06 calibers, with a four-shot box magazine and folding-leaf rear/hooded ramp front sights and a 22-inch barrel. It weighs about 7.5 pounds and has a checkered French walnut stock that is equipped with sling swivels, and has been manufactured from 1967 to date.

Browning BAR Magnum. This is a gas-operated semiautomatic rifle in .243 Winchester, .270 Winchester, .308 Winchester, .30-06, 7mm Remington Magnum and .300 Winchester Magnum calibers, with a four-shot (three-shot for Magnums) box magazine and folding-leaf rear/hooded ramp front sights and a 24-inch barrel. It weighs about 7.5 pounds and has a checkered French walnut stock that is equipped with sling swivels and a recoil pad. This rifle has been manufactured from 1969 to date.

Browning BL-22 Lever Action Repeating Rifle. This is a 'short-throw' lever action rifle in .22 short, long and long rifle calibers, having a 15 to 22-shot (depending on ammo used) tubular magazine and folding-leaf rear/bead fronts sights with scope mounting grooves on the receiver. It has a 20-inch barrel and weighs five pounds. Its walnut straight-grip stock is furnished with a barrel band. This rifle has been manufactured from 1970 to date.

Browning BLR Lever Action Repeating Rifle. This is a lever action repeating rifle in .243 Winchester, .308 Winchester and .358 Winchester calibers, having a four-round detachable box magazine, adjustable rear/hooded ramp front sights and a 20-inch barrel. It weighs approximately seven pounds and has a checkered walnut straight-grip stock complete with barrel band and recoil pad. This rifle has been made from 1971 to date.

Browning 78 Single Shot Rifle. This is a single shot, falling block rifle in .22-250, 6mm Remington, .243 Winchester, .25-06, 7mm Remington Magnum, .30-06 and .45-70 Government, having open rear/blade front sights on the .45-70 model only—all others have no factory sights. Its barrel length is 24 to 26 inches, with octagon or heavy round styles available, and weighs from 7.8 to 8.8 pounds, depending on caliber and barrel choice. This rifle has a fancy checkered walnut stock; more precisely, the .45-70 model has a straight-grip stock with curved butt plate, while the others have stocks equipped with a Monte Carlo comb, a cheekpiece, a pistol grip with cap and a recoil pad. The Browning 78 Single Shot Rifle has been manufactured from 1973 to date.

Browning offered a limited-edition Bicentennial 78 Set, which included a Model 78 in .45-70 caliber, with receiver engravings that featured a bison and an eagle, plus scroll engraving on top of the receiver, lever, both ends of barrel and butt plate; and a high grade walnut stock and forearm. Also as part of the set, an engraved hunting knife and stainless steel commemorative medallion, were included. Rifle, hunting knife and medallion fit in a custom alderwood presentation case, and the items in each set have matching serial numbers beginning with '1776' and ending in numbers from 1 to 1000. The Bicentennial 78 edition was limited to 1000 sets, and all were made in 1976.

Browning BAR .22 Automatic Rifle. This is a semiautomatic rifle in .22 long rifle caliber, with a 15-shot tubular magazine and a 20.3-inch barrel. It weighs approximately 6.3 pounds and has folding leaf rear/gold bead ramp front sights, with scope mount grooves in the receiver, and a checkered French walnut pistol-grip stock. This rifle was introduced in 1977.

Browning BPR .22 Pump Rifle. This is a hammerless slide-action repeating rifle in .22 long rifle and .22 Magnum rimfire, having a tubular magazine that holds 15 of the former or 11 of the latter ammunition, and has a 20.3-inch barrel. It weighs approximately 6.3 pounds and has folding leaf rear/gold bead ramp front sights, with scope mount grooves in the receiver, and a checkered French walnut pistol-grip stock. The Browning BPR .22 Pump was introduced in 1977.

Below: **These finely finished A-Bolt Centerfire Rifles were designed with the hunter in mind. Because the A-Bolt's 60 degree bolt requires less movement than a 90 degree bolt, the hunter can get back on target quicker for fast follow-up shots. The A-Bolt is the lightest (about seven pounds) Browning bolt action rifle.**

The Pittman-Robertson Act

In 1987, Browning joined in the commemoration of the 50th Anniversary of the Pittman-Robertson Act, which is known officially as the Federal Aid in Wildlife Restoration Act. Pittman-Robertson may well be the single most important piece of legislation ever enacted to benefit wildlife.

Over half a century ago—in 1937—the Pittman-Robertson Act was sponsored by Senator Key Pittman of Nevada and Representative A Willis Robertson of Virginia. This act directs the proceeds of an 11 percent excise tax—on the manufacturing cost of guns and ammunition—specifically to programs involving wildlife management. The fundamental concept was that sportsmen would directly help pay for the needs of wildlife through monies collected by the tax.

This excise tax was heartily supported by sportsmen and the wildlife management community. Recent amendments have broadened it to include archery equipment and pistols as well, and each year, more than $100 million is collected from sportsmen through this tax. Over the past five decades of Pittman-Robertson, more than $1.5 billion has been collected for wildlife.

State wildlife agencies receive portions of these monies according to a formula, the criteria of which are the state's population, its general need and the number of hunting licenses sold in that state. The state proposes conservation or research programs and, if approved, Pittman-Robertson funds will cover up to 75 percent of the cost—or, in dollar terms, three dollars for every one dollar put up by the state.

More than 62 percent of the money collected goes directly into land acquisition. Since the program began, over 3.7 million acres have been purchased to develop and operate wildlife management areas. Purchasing land and improving habitat has always been of utmost importance, as habitat loss is the most significant cause of reduced wildlife populations. Twenty-six percent goes directly into research or surveys. A recent amendment allows about seven percent of the tax to be spent on hunter education programs. The remaining five percent goes to the states for planning and supervision, and for providing and distributing technical information to the pertinent agencies. Funds are used where they are needed most—for both game and protected animals.

Newer Shotguns

Browning Shotguns

The following Browning shotgun was distributed by Browning of St Louis, Missouri, but was manufactured by Remington Arms Company of Ilion, New York. It is based on the original John M Browning autoloading shotgun design.

Browning Grade I Three or Five Shot Autoloading Shotgun. This is a recoil-operated autoloading shotgun in 20, 16 or 12 gauge, having a two- or four-shot tubular magazine, and a 26- to 32-inch standard barrel with any standard boring. This shotgun weighs from about 6.9 to eight pounds depending on gauge and barrel length, and has a checkered pistol-grip stock. It was available in Special, Special Skeet and Utility Field models. The Grade I Three or Five Shot Autoloading Shotgun was made from 1940 to 1949.

The following are major modern Browning shotguns which have been manufactured for Browning of Morgan, Utah, by Fabrique Nationale d'Armes de Guerre (now Fabrique Nationale Herstal) of Herstal, Belgium, and by Miroku Firearms Mfg Co of Tokyo, Japan. Many of these are either updates of or follow-ons to, original John M Browning designs.

Browning Automatic-5, Standard. This is a recoil-operated shotgun in Magnum 20, 16, Magnum 12 and 12 gauge, with pre-World War II 16-gauge guns having been chambered for 2.6-inch shells, and with standard 16 gauge guns having been discontinued in 1964. With a four-shot magazine and one in the chamber, prewar guns were also available in three-shot models. Barrels for these guns are from 26 to 32 inches in length, and barrel styles include plain, raised matted rib and ventilated rib with a choice of standard chokes. Weight, depending on stylistic treatment, runs from 7.3 to eight pounds. The Browning Automatic-5 can be found in Trap, Magnum 12, Light 12, Buck Special, Magnum 20 and Skeet models, and generally has a checkered pistol-grip stock. It was made from 1900 to 1973.

Browning Sweet 16 Automatic-5. This is a recoil-operated shotgun in 16 gauge, with a four-shot magazine and one in the chamber. Barrel lengths for this gun were from 26 to 32 inches, and included plain with striped matting on top of barrel, raised matted rib and ventilated rib styling. This gun weighed from 7.3 to eight pounds, with a lightweight version that has a gold-plated trigger. The Browning Sweet 16 Automatic-5 was made from 1937 to 1976.

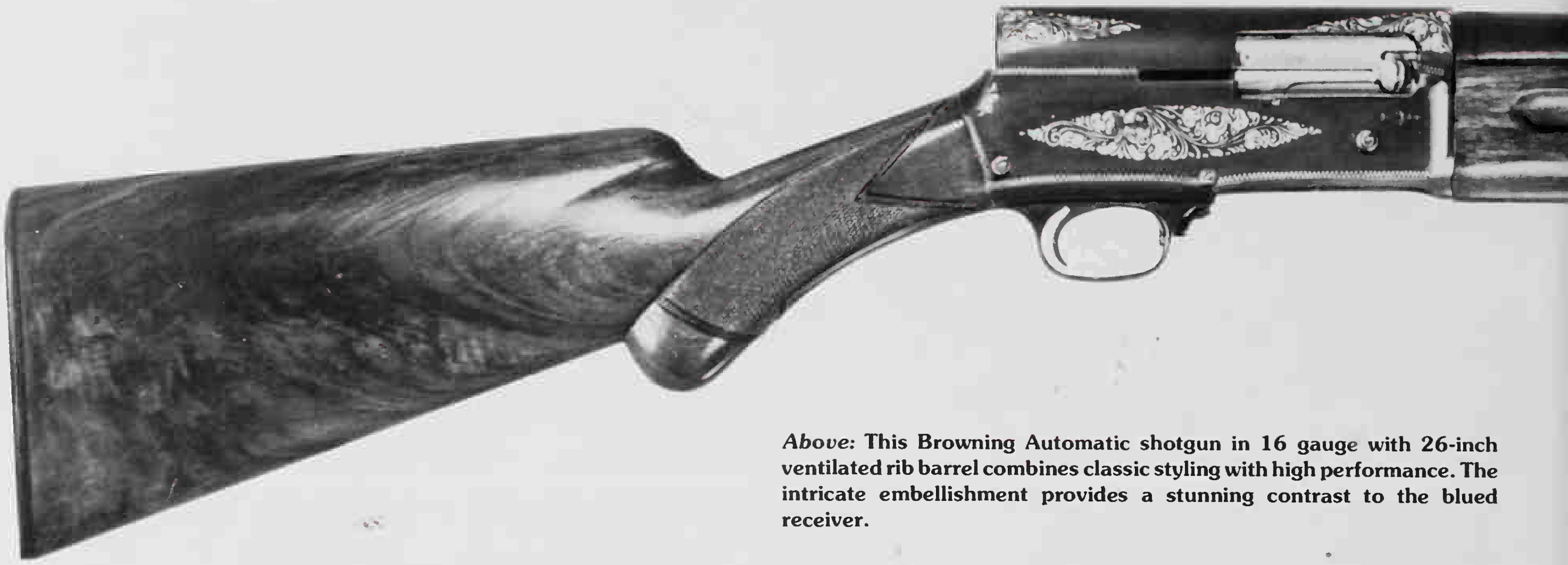
Browning Superposed Hunting Shotguns. These are double-barrel, over and under, box lock shotguns, equipped with selective automatic ejectors and a selective single trigger (earlier models had double triggers, twin selective triggers or a non-selective single trigger). Bores run from .410 to 12 gauge, with any standard choke, and barrel lengths run from 26.5 to 32 inches. Styles include raised matted rib or ventilated rib, with the prewar Lightning model without barrel rib, and the postwar version of same supplied only with a ventilated rib, and weights run from 6.3 to 7.7 pounds. Stocks tend to be checkered, with pistol grip.

The higher-grade Superposed Hunting Shotguns—the Pigeon, Pointer, Diana, Midas and Grade VI models—differ from standard Grade I models in overall quality, engraving, wood and checkering; also, Midas and Grade VI guns are

Right, above and below: **Delicate scrollwork covers the polished grey receiver of this Grade VI Citori. The left side of the receiver features three mallard drakes. The Grade VI Citori can also be customized with a blued receiver and gold inlay.**

Browning and Bows

SPECIAL STEEL 12GA-2¾" AND 3"-28"



Above: **This Browning Automatic shotgun in 16 gauge with 26-inch ventilated rib barrel combines classic styling with high performance. The intricate embellishment provides a stunning contrast to the blued receiver.**

richly gold-inlaid. Browning Superposed Hunting Shotguns have been made from 1928 to the present.

Browning Double Automatic, Standard Grade (Steel Receiver). This is a short recoil system autoloading shotgun in 12 gauge only, having a two shot capacity, and barrel lengths from 26 to 30 inches. These guns are equipped with any standard choke and weigh about 7.8 pounds, having checkered pistol-grip stocks. They were made from 1955 to 1961.

Browning Twelvette Double Automatic. This is a short recoil system autoloading shotgun in 12 gauge, having a two-shot capacity, and having barrel lengths from 26 to 30 inches, with a wide selection of any standard choke.

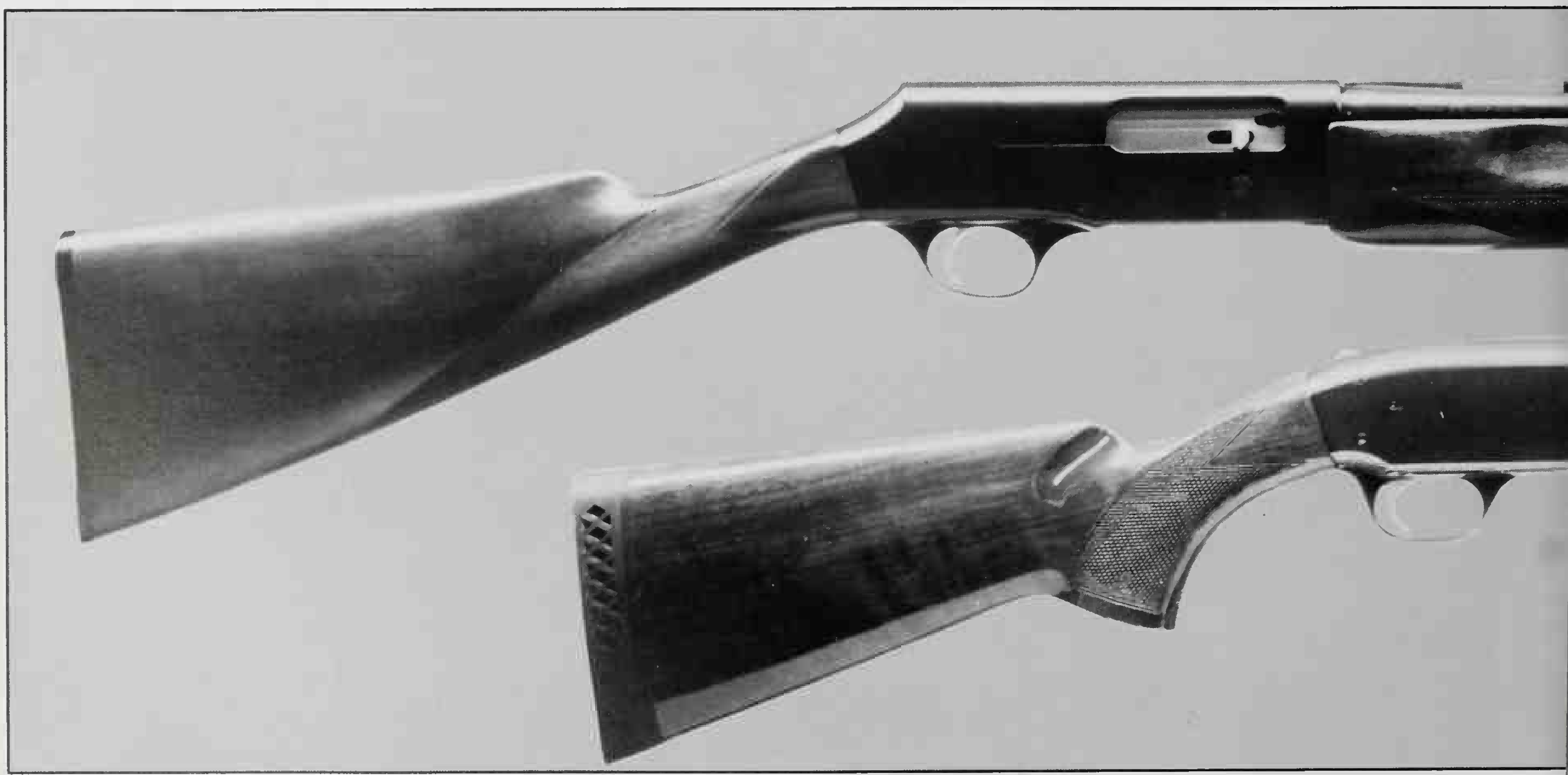
This is essentially a lightweight version of the Double Automatic, with an aluminum receiver, and a weight of 6.8 to seven pounds, depending upon barrel length. Receivers for the Twelvette series were anodized in grey, brown and green with silver engraving. The Twelvette was made from 1955 to 1971.

Browning BT-99 Grade I Single Barrel Trap Gun. This is a single-shot, box lock shotgun with an automatic ejector mechanism, in 12 gauge, with a 23- or 24-inch ventilated rib barrel and modified, improved modified or full choke. It weighs about eight pounds and has a checkered pistol-grip stock with beavertail forearm and recoil pad. The BT-99 has been made from 1971 to date.

Browning BSS Hammerless Double Barrel Shotgun. This is a double barrel, side by side, box lock shotgun in 20 and 12 gauge, with automatic ejectors and a non-selective single trigger. Barrels range from 26 to 30 inches, with chokes ranging from improved cylinder and modified, to modified and full, to both barrels in full choke. Barrel styling is a matted solid rib, and weights are approximately seven to 7.3 pounds.

Stocks tend to be checkered pistol-grip, with beavertail forearm variety. This gun has been made from 1972 to date.

Browning Liège Over and Under Shotgun. This is a box lock superposed double barrel shotgun, with automatic



ejectors and a non-selective single trigger in 12 gauge. Barrel lengths range from 26.5 to 30 inches, with choke combinations of improved cylinder and modified, modified and full or both barrels full choke. The barrel style is ventilated rib-type, with gun weights, depending upon length of barrels, ranging from 7.3 to 7.9 pounds. A checkered pistol-grip stock completes the picture for this shotgun that was manufactured from 1973 to 1975.

Browning Citori Over and Under Hunting Shotgun. This is a double barrel, over and under, box lock shotgun in 20 and 12 gauge, having automatic ejectors and a selective single trigger. Barrels range from 26 to 30 inches, with choke combinations including improved cylinder and modified, modified and full and both barrels at full choke. Trap and Skeet models are major variants. With standard ventilated rib styling, weights, depending upon barrel length, run from 6.8 to 7.8 pounds. A checkered pistol-grip stock with recoil pad and semi-beavertail forearm are standard for this shotgun line that was made from 1973 to date.

Browning 2000 Gas Automatic Shotgun. This is a gas-operated autoloading shotgun in 20 and 12 gauge, having a four-shot magazine and barrel lengths from 26 to 30 inches with any standard choke. Plain matted barrel or ventilated rib are available, with gun weights ranging from 6.7 to 7.8 pounds, depending upon gauge and barrel. A checkered pistol-grip stock is standard, and this gun is also available in Field, Magnum, Buck Special, Trap and Skeet Models. The Browning 2000 has been made from 1974 to date.

Browning BPS Pump Shotgun. This is a pump action repeating shotgun in 12 gauge, with a magazine that holds five 2.8- or four 3-inch shells, and has available barrel lengths of from 26 to 30 inches. Chokes offered are improved cylinder, modified or full, with a ventilated rib barrel. This shotgun weighs 7.8 pounds more or less (depending on barrel length). It was introduced in 1977.

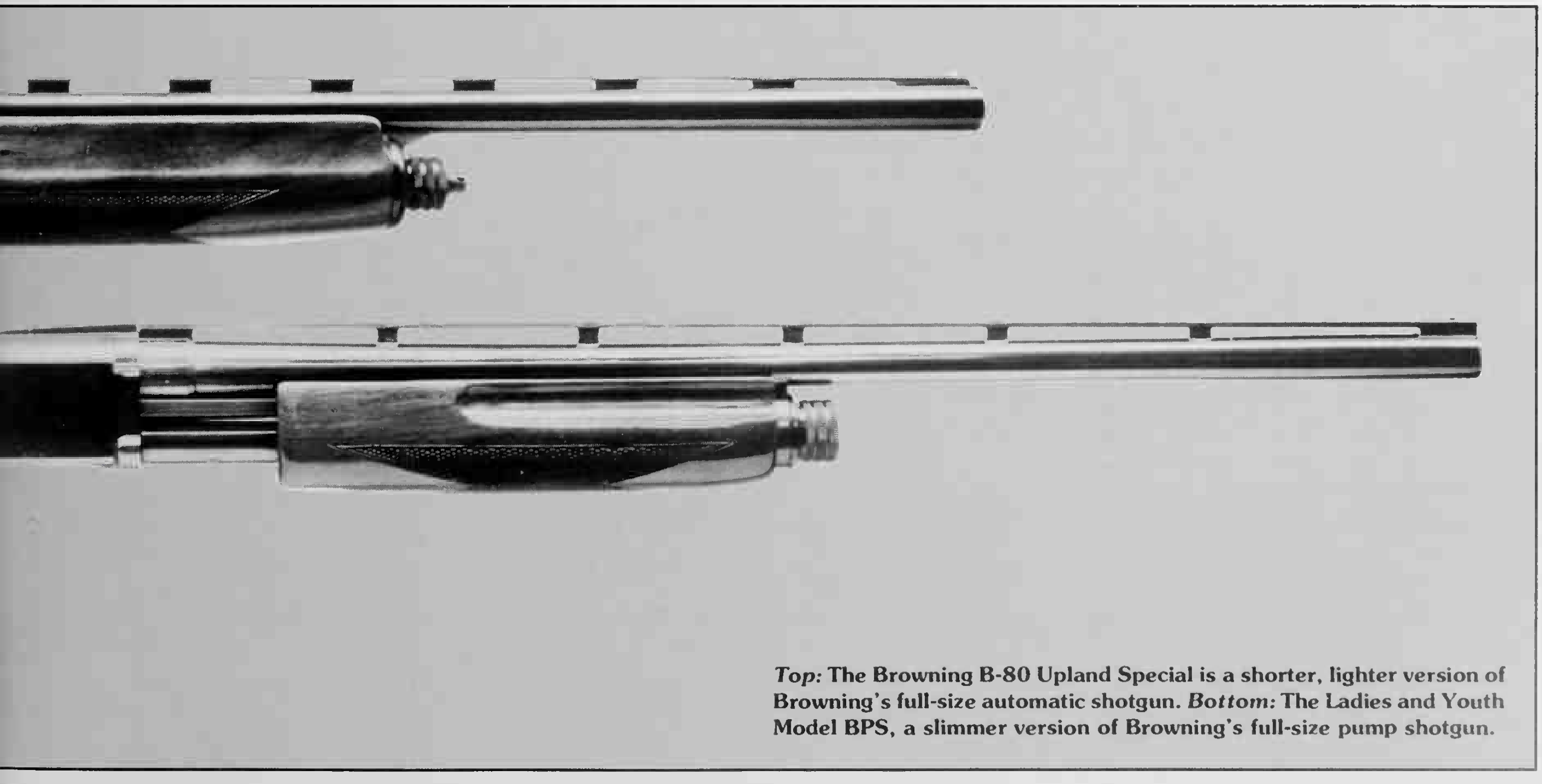
Browning Bows

Browning bows are designed by experts. Harry Drake, Browning's master bow designer, is well known to the world of archery. His Special Flight bow designs have dominated the National Archery Association Flight Championships since 1947.

On that date, the National and World Flight Record for the greatest distance an arrow was shot from a hand held bow was established with a Flight Bow designed by Harry Drake. The current World Flight Record for maximum distance from a hand held bow, in both men's and women's professional competition, was set with Drake flight bows.

In addition, every World Flight Record for foot bows since 1959 has been attained with a Drake design. Harry Drake also designed the compound hunting bow that shot a conventional 450 grain broadhead hunting arrow a spectacular 582.8 yards—the greatest flight distance ever recorded for a hunting arrow. This amazing feat was achieved in 1976, at the Utah State Bow Hunters' Annual Shoot.

An outstanding competitor in his own right, Harry Drake currently holds several National Archery Association flight



Top: **The Browning B-80 Upland Special is a shorter, lighter version of Browning's full-size automatic shotgun.** ***Bottom:*** **The Ladies and Youth Model BPS, a slimmer version of Browning's full-size pump shotgun.**

From top to bottom: The Limited Edition Superposed Pintail Duck Issue is hand engraved with delicate rosette patterns. Each firearm is inlaid and engraved with 18 karat gold. A handsome complement to this fine shotgun is the Limited Edition Black Duck Issue. Also shown are the Superposed Express Rifle, the Superposed Continental and rifle barrels for the Continental.

records, including the regular foot bow record of over 1542 yards. Harry also holds the honor of having shot an arrow further than any other man in the world. In 1971, using a Harry Drake bow in the Unlimited Foot Bow division, Harry shot an arrow 2028 yards, or 6084 feet! This earned him a place in the Guiness Book of World Records. More to the point, to design a bow and use it to shoot an arrow that far takes a thorough knowledge of how and why a bow limb works.

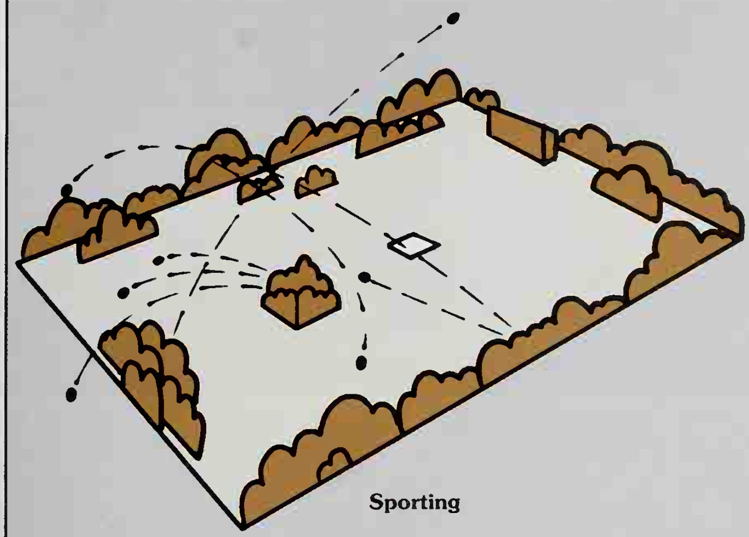
Browning bows are built for arrow speed, which depends entirely on how well the bow limbs can store and transmit energy. In theory, a bow's stored energy should be equal to, or greater than, the peak draw weight. In practice, this is rarely true. Friction in the cables and cams, combined with limb drag, can reduce a bow's energy by more than 10 percent.

To avoid this loss, Browning mounts its cams in limb notches rather than on bulky metal hangers. This helps the cams to operate smoothly, and doesn't add any unnecessary weight or drag to the limbs—thus, Browning bows utilize more of the bow limb's stored energy.

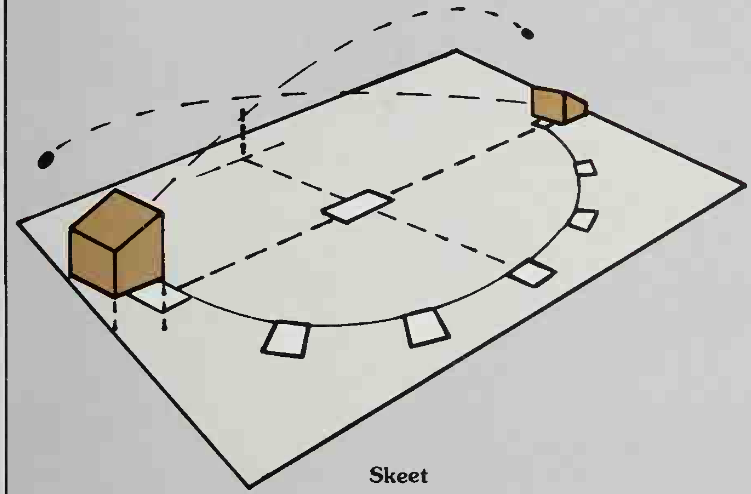
All Browning compound bows store more foot-pounds of energy than their respective peak draw weights. By comparison, when other bows of competing designs were tested, it was found that many of them stored less than their peak draw weights. On Browning 'four-wheelers,' the cables are attached to extending tuning bars, which allow the bow to be more accurately 'set,' or tuned, which in turn means more of the bow's energy is harnessed and not wasted.

Browning wood handle compound bows incorporate a warm, solid hand-filling riser that has been sculptured into a pistol grip. The African hardwoods that are used combine superior strength with the type of wood grain one is accustomed to seeing on high quality rifles and shotguns. These bows are easy to carry, weigh less than most other comparable bows and are easy to hold on target.

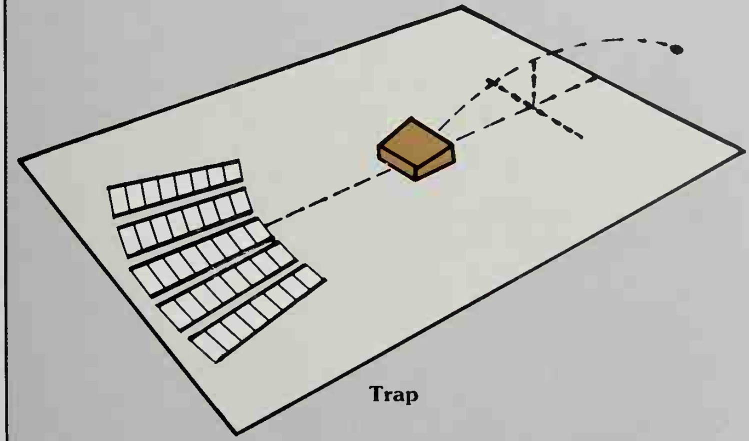
Below: **In addition to its firearms, Browning also produces a line of bows, many of which are the inspirations of master bow designer Harry Drake. Known for their speed and accuracy, Browning bows are made for both hunting and range archery.**



Sporting



Skeet



Trap

Shooting Sports

Non-game shooting sports involving shotguns fall into three main categories: Sporting, Skeet and Trap. The technical definition of each is as follows.

Sporting is of British origin, and has not yet been included in the roster of Olympic specialties, as trap and skeet shooting have. Nevertheless, this is a form of clay pigeon shooting that is rapidly gaining in popularity, as it closely replicates the true hunting environment. Clay traps are concealed diversely over a free course where they execute a plethora of throws, imitating high-flying pheasants; bolting rabbits; birds flying in front, and to the side, of the shooter; and game of various types skimming over the ground or rising up from brush. The action takes place both in the woods and out in the open.

Skeet shooting is practiced on a semicircular layout. A release hut is located at each end of the circle's diameter—a distance of 36.8 meters, or 40 yards. The left hut is termed the 'high tower,' and the right one the 'low tower.' The clay pigeons are shot at from eight stations in succession.

First the clay pigeon is thrown from the high tower, and then from the low tower, and so on. The shooter is entitled to one cartridge per clay, and each time, shoots from a different station on the circle. Shots from stations 1, 2, 6 and 7 involve 'doubles' in which clay pigeons are thrown simultaneously from the two towers. The shooter must try to break them with one cartridge per target, taking his first shot at the clay thrown from the nearest hut and his second at the one thrown from the farthest hut.

A complete series of eight stations therefore involves 25 clay pigeons. Skeet shooting is not only an official Olympic sport, but is also an excellent discipline for shooters who want to engage in their favorite sport outside of the regular game season.

Trap shooting is another Olympic specialty, but it is neither necessary to be a champion, nor is it necessary to have a costly trap range at one's disposal to enjoy trap shooting as a rewarding leisure activity.

Shooters are placed at a distance of 15 meters—or approximately 16.4 yards—behind a trench in which one or more throwing machines are installed. These machines are variously adjusted to provide a wide variety of clay pigeon trajectories. These trajectories are circumscribed by the limits established by International Regulations.

The starting order of the machines is purposely random, and the velocity, orientation and height of the clay's flight can vary with every shot. For Olympic events, 15 throwing machines are used; for Universal trench shooting, five machines are used; and for International ball-trap shooting, one machine is used. The shooter is entitled to 2 cartridges per clay. He changes his position for each clay pigeon. A complete trap shooting series is composed of 25 clay pigeons.

Browning and Special

Craftsmanship

Craftsmanship and fine gunmaking are traditions at Browning. Take the exquisite work done on Browning Superposed shotguns for example. Each Browning Superposed is a unique masterpiece, in the best gunmaker's tradition, and a living proof of his love for his craft. Steels are selected for their high strength, taking into account the more than 24 different variants that are determined by the end-use of the part. French walnut is used for the stocks, having been selected for its density and the beauty of its veining and color.

The 84 parts that make up each Superposed are the result of 794 operations conducted on precision machinery; 64 of these parts undergo heat-treating according to their respective functions. In the course of the manufacturing processes, 1490 carefully-designed gauges and measuring tools are used to control 2310 dimensions. Machines then give way to the gunsmiths, who carry out by hand the striking off, fitting in, timing and finishing.The gunsmithing tradition is so strong in these craftsmen that, for example, each barrel filer makes his own tools—which he will then use for the external trueing of the barrels and for smoothing off the upper and side ribs.

This hand work confers individuality and excellence upon each gun. The gunsmiths who assemble the three principal elements of the gun—the action frame, the barrels and the foreend—use the technique of lampblacking, an ingenious method which is both simple and efficient. This ancient process is in fact the only way to 'see' the proper fitting and timing of the parts inside the closed gun. The gunsmith covers the parts in a fine layer of lampblack, or soot, produced by the flame of an oil lamp. He then fits them firmly together before taking them cleanly apart again. If there has been any friction between the parts, the lampblack will have disappeared. The gunsmith can then make any necessary modifications. This operation is repeated several times, until the fitting meets the very severe standards imposed by Browning.

In order to ensure the specified fit between the wood and steel section, the craftsman uses a technique similar to that involving lampblack, but this time, a special red dye is smeared on the action frame, which is then locked onto the stock. The gunsmith then disassembles the parts, and checks the places marked with red dye for proper fit, makes the necessary alterations, and thereby effects a precise fit.

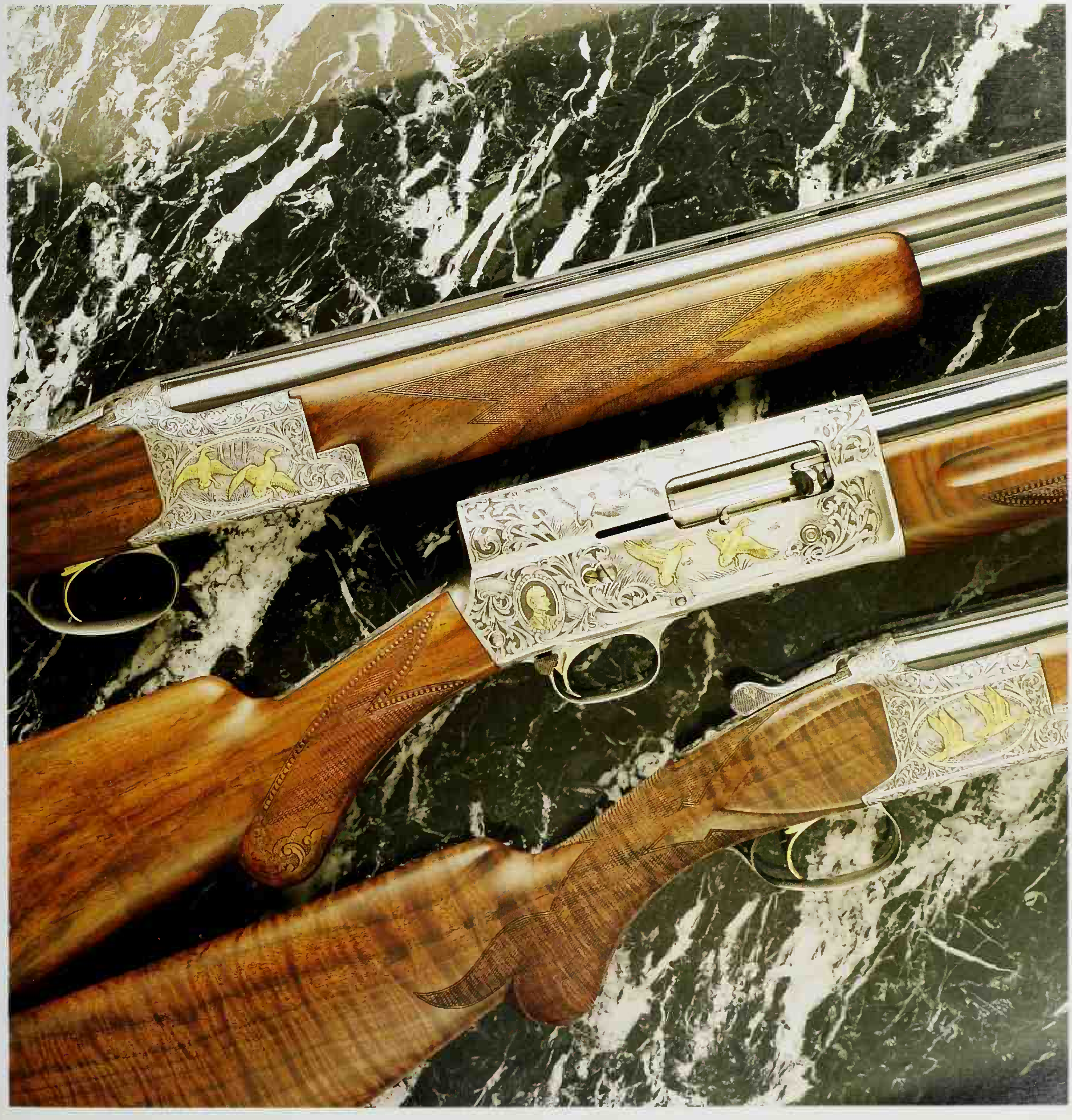
One by one, with a watchmaker's meticulousness, each operating part of the firearm is carefully fitted. At the same time, stocks and foreends are rough cut, shaped, adjusted, carved and smoothed off. Each operation is carried out by hand, with a skill comparable to the fine materials being used. Only patience can succeed in the slow process of crafting steel and wood to a peak of artistry.

Then it's time for hand checkering; this is a process of regularity, precision and sureness of touch, and requires a true woodcrafter's knowingness. The surfaces that are to be engraved are then polished to an impeccable sheen, and the craftsman passes yet another work of art to those who will now adorn it with exquisite engravings.

Fabrique Nationale Herstal perpetuates Liège's traditional engraving of firearms. When asked by a visiting journalist to describe the most important personal quality of a good engraver, a Browning master engraver quickly answered, 'An iron constitution.' Engraving on steel does indeed demand, in addition to a very thorough artistic training, quite unusual powers almost 'spiritual' in their nature. It demands

Select walnut stocks and exquisite engraving exemplify the fine, traditional craftmanship found in today's Browning firearms. *At right, from top to bottom:* A Black Duck Issue Superposed, a Gold Classic Automatic-5 and a Pintail Duck Issue Superposed.

Craftsmanship Editions



concentration, calmness, sureness of hand and physical endurance to such degrees that only a few men are able to properly do the work.

It is an art that is executed with pointed chisels and a small, flat-headed hammer with which to strike them. With these, the craftsman carves out the drawing with a rare continuity and smoothness of line. It is a technique calling for absolute perfection, because one can not use an eraser on steel.

Browning offers an extremely wide array of classic, fine engraving styles, with accompanying backgrounds, figurative motifs, gold inlay and, in short, absolutely everything there is to offer in the way of firearms embellishment.

The fact that the over and under barrels give the Browning Superposed its characteristic elegance is the happy outcome of a number of functional advantages that result from its design, which has been widely copied. The arrangement of the barrels one above the other give the shooter a better view of the target, and allow faster and more precise aiming. No other double-barrelled shotgun will allow a well-aimed second cartridge to be fired so quickly after the first.

Special Editions

All major gun manufacturers produce special edition firearms and Browning is no exception. The firearms given in the following are among Browning's more famous special editions.

The Two Millionth Browning Automatic-5 Shotgun is a museum-quality firearm that was fit for a king and was actually produced for a President. In early 1970, the Two Millionth Auto-5 was taken from the production line and placed in the hands of Browning's very best Belgian craftsmen to be prepared for presentation to the then United States President, Richard M Nixon, who, under carefully-made arrangements, would then donate the gun to the Smithsonian Institution. Due to political considerations, the presentation to President Nixon and ultimately to the Smithsonian was never made.

The inlaid designs and patterns on the Two Millionth Auto-5 were created by Browning's master engraver, Andre Watrin, whose signature is engraved on the forward portion of the trigger guard. All gold inlay was executed by Master Engraver Jose Baerten and G Vandermissen. The designs on this unique firearm were inspired by an early exposition model Auto-5 that had been embellished by Browning's famous Master Engraver Felix Funken in 1930.

Technically, there is little engraving per se on this superb firearm, because all the decorative work was of 18 and 20 karat gold inlay. The left side of the receiver features a wreath framing the profile of John M Browning; above this is the description 'Browning Automatic Shotgun Number 2,000,000,' surrounded by elaborate border work and three mythological Chimera. The right side of the receiver features a wreath framing the symbol of the city of Liège, Belgium, in addition to elaborate scrollwork and eight

SPECIAL STEEL 12GA

intricately inlaid mythological subjects of varying sizes. The top tang bears the gold inlaid signature of John M Browning, bordered by scrollwork and delicate gold borders.

The scrollwork featured on the receiver, tang, trigger guard and barrel is of 'fleur-de-lis' design. The gunstocks are of the highest grade walnut, featuring superb checkering performed by P Hanauer, Browning's best checkerer and woodcarver. The stock features a pistol-grip cap with a gold-plated oval inlay, bearing the inscription, 'Manufactured by Browning Arms Co, June 6, 1970. Invented by John M Browning, October 9, 1900.' Shipped to the United States on 26 June 1970, the gun was displayed in a special one-of-a-kind Browning Pro-Steel safe, featuring a handsome, full-color wildlife painting on the front door, a specially polished and finished interior, special lighting and a motorized rotating stand that provided a truly dramatic display.

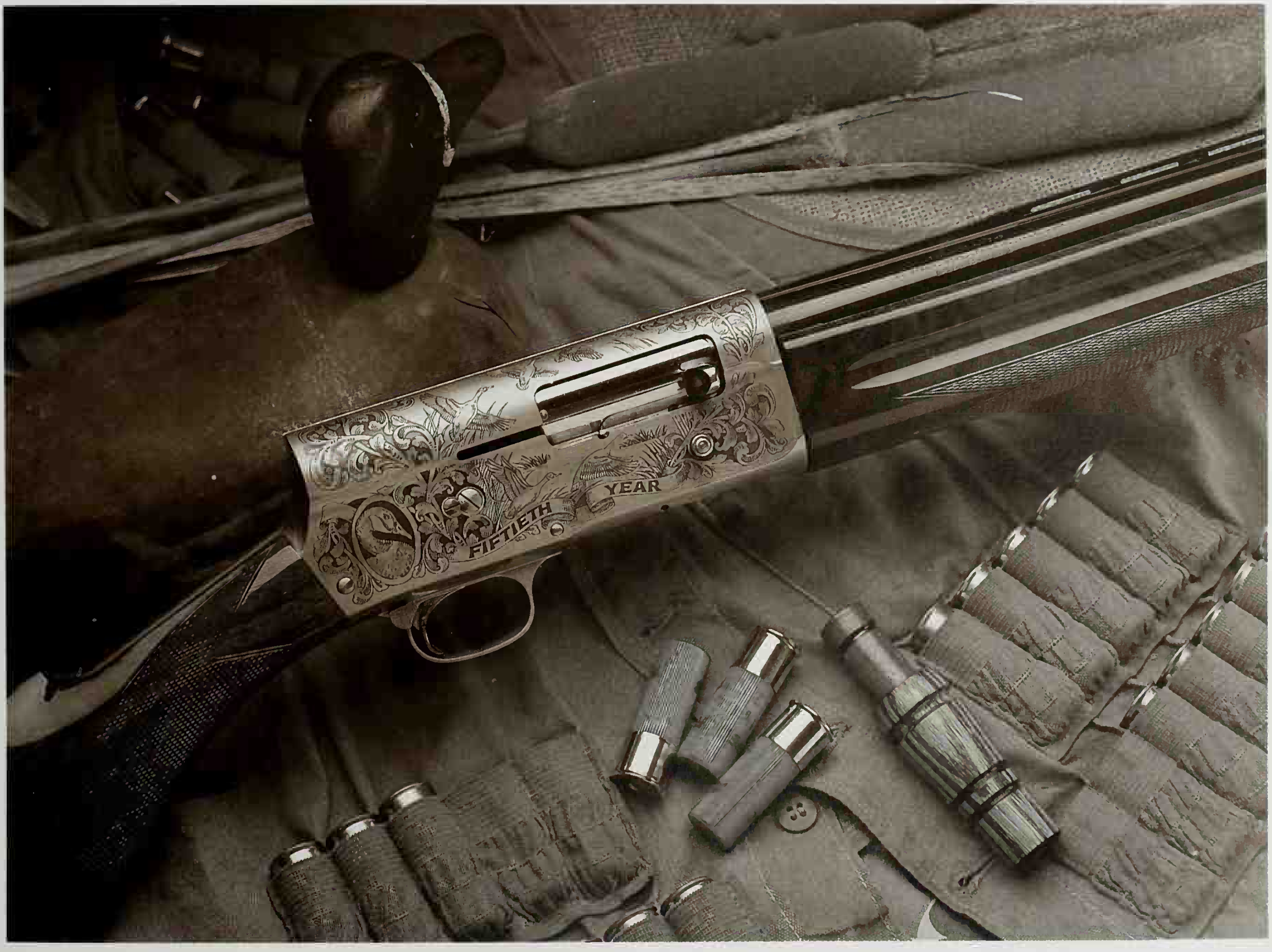
It remained with Browning for some 15 years while the company sought an appropriate and meaningful use for this historic one-of-a-kind firearm. Then, in 1985, Browning offered the shotgun to the National Shooting Sports Foundation for display and auction at the Eighth Annual Shot Show in Houston, Texas. The proceeds from the sale went to the National Shooting Sports Foundation educational programs on safety, ethics and wildlife conservation in the shooting sports.

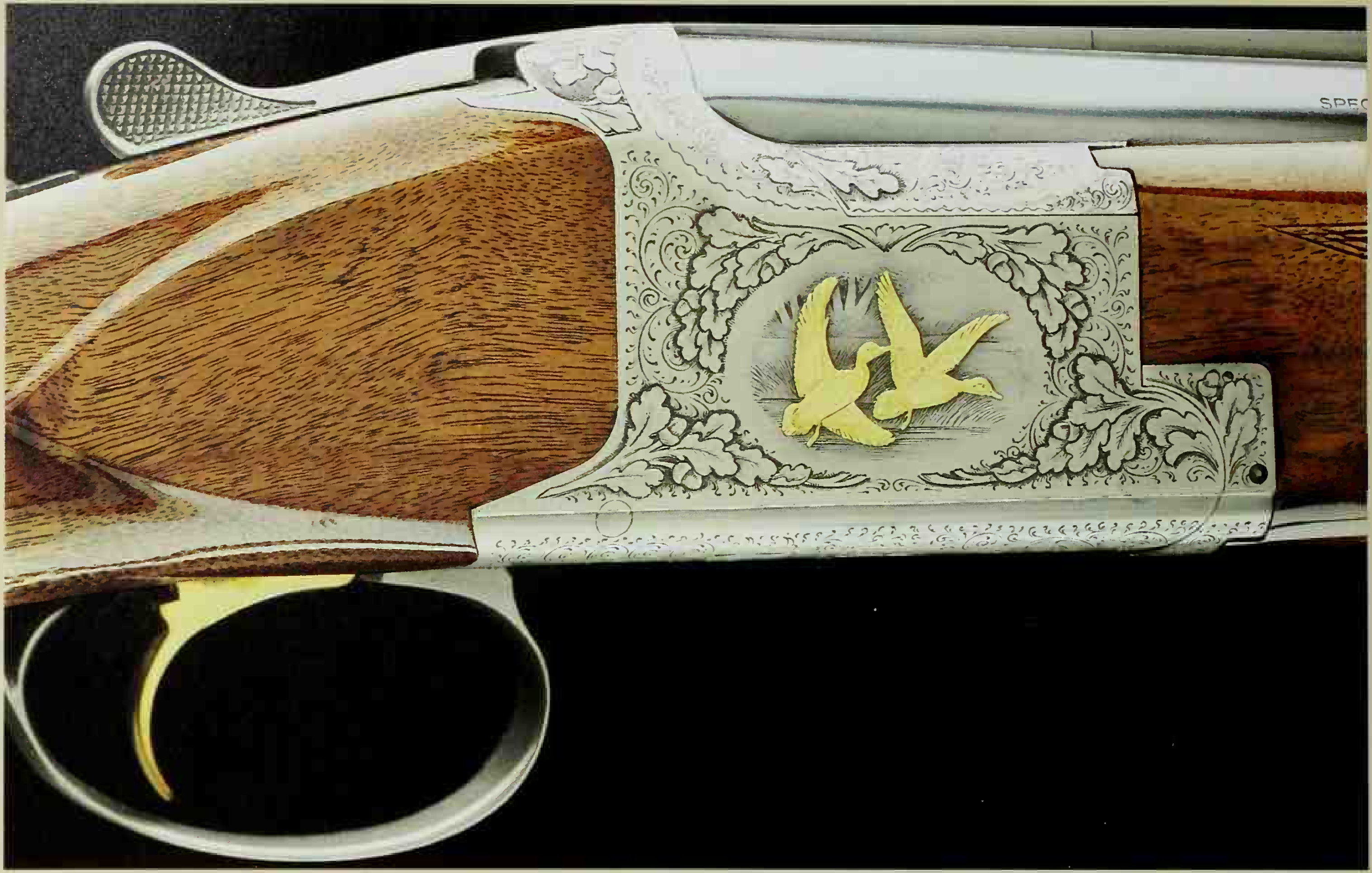
The Bicentennial Commemorative Superposed is a special limited edition issued to commemorate the United States Bicentennial. Fifty-one Guns were produced in 1976, each one of which celebrates one state of the Union and Washington, DC. The receivers feature side plates engraved with a gold-inlaid hunter and wild turkey on the right side, and the United States flag and bald eagle on the left side, with specific state markings inlaid in gold, and all on a deep blued background. The stocks and forearms are of American walnut, highly figured with decorative checkering. These are among the rarest of Browning firearms and some collectors value them today in excess of $10,000 each in new, unfired condition.

The Jonathan Browning Mountain Rifle commemorates Browning's roots in the Browning family. When Jonathan Browning invented his Cylinder Repeating Rifle, he designed a unique trigger system to operate it. During their development of the Jonathan Browning Mountain Rifle, Browning designers of the late 1970s found that, by making some modifications to this trigger system, they could give black powder enthusiasts a single trigger that functioned both as a standard trigger and as a highly sensitive 'set' trigger.

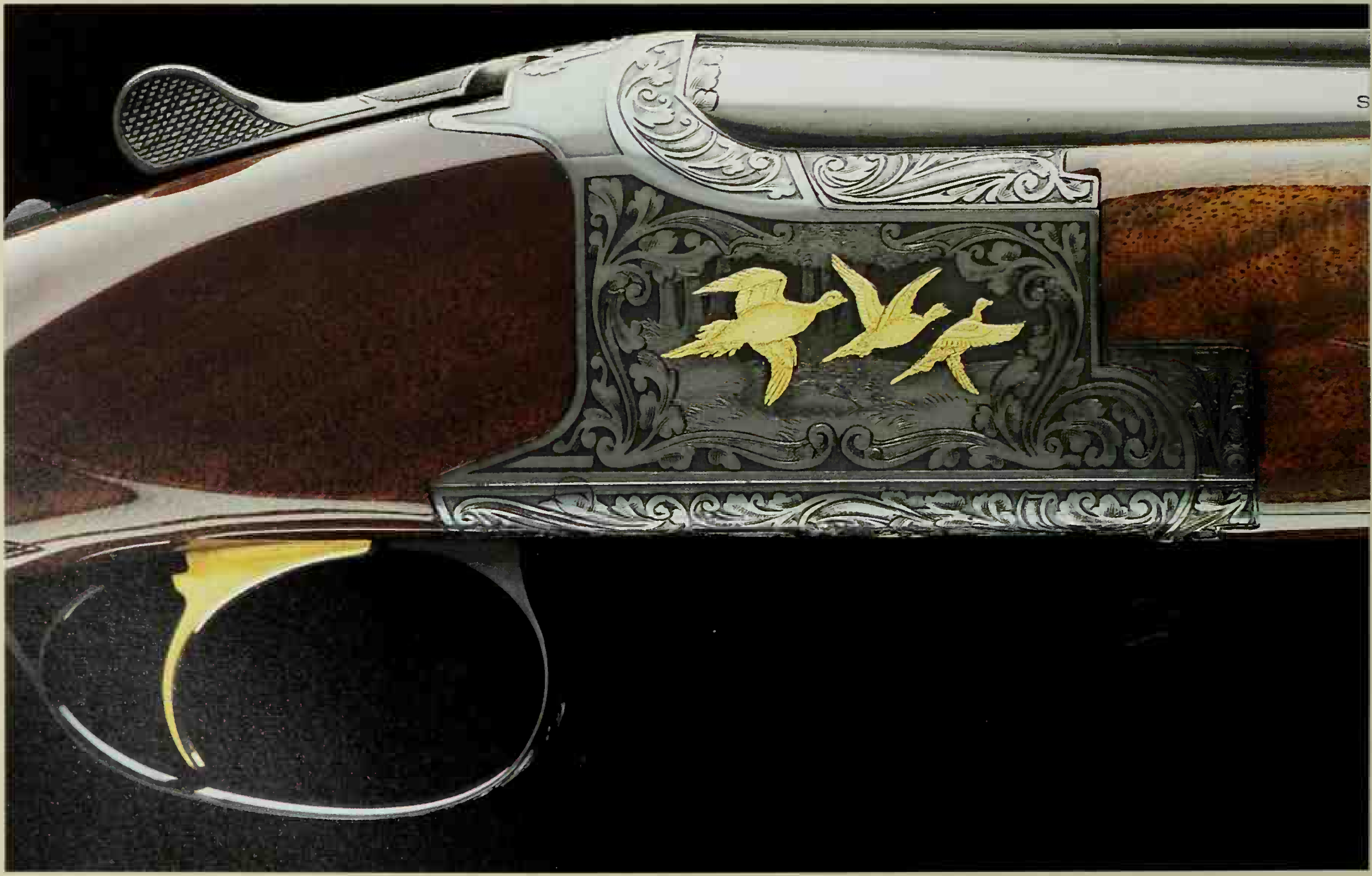
In addition to being remarkably fast and smooth, this newly patented trigger was amazingly uncomplicated. For the standard trigger, one had simply to cock the hammer

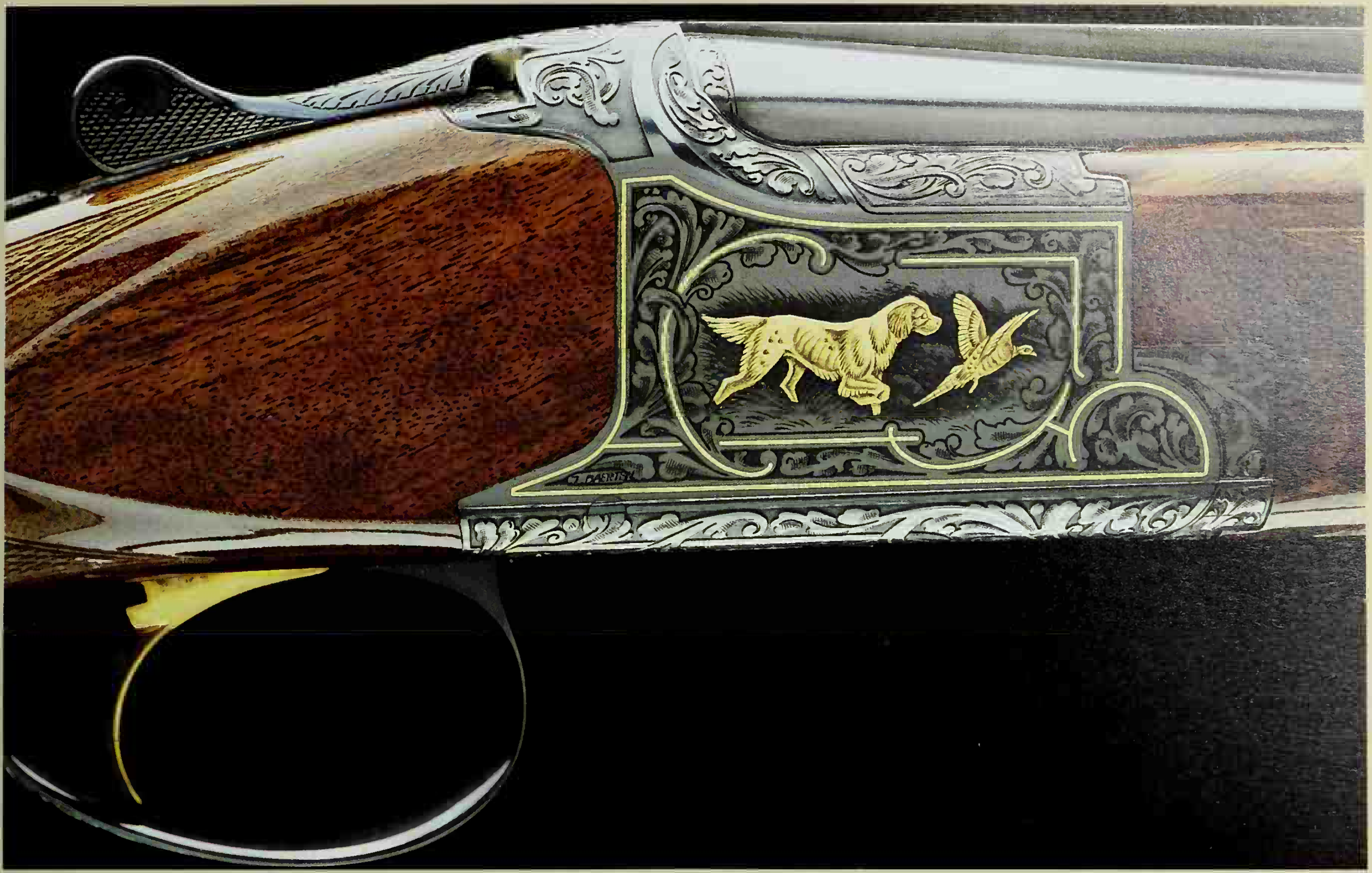
***Opposite:* In contrast to the ornate engraving on the shotguns pictured on page 99, this superposed has a simple yet elegantly engraved receiver. *Below:* The Browning Auto-5 Ducks Unlimited 50th Anniversary Gun of the Year.**



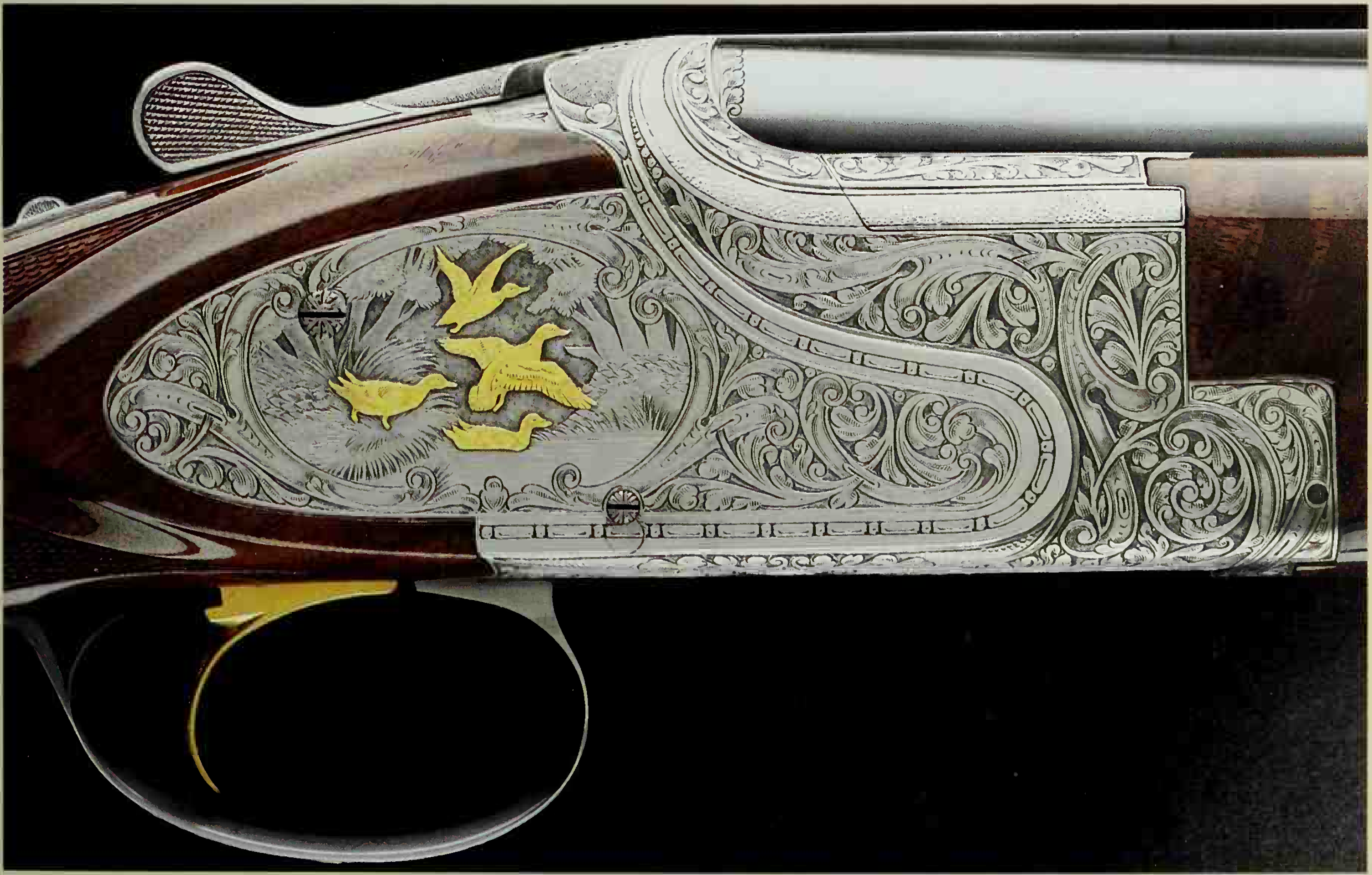


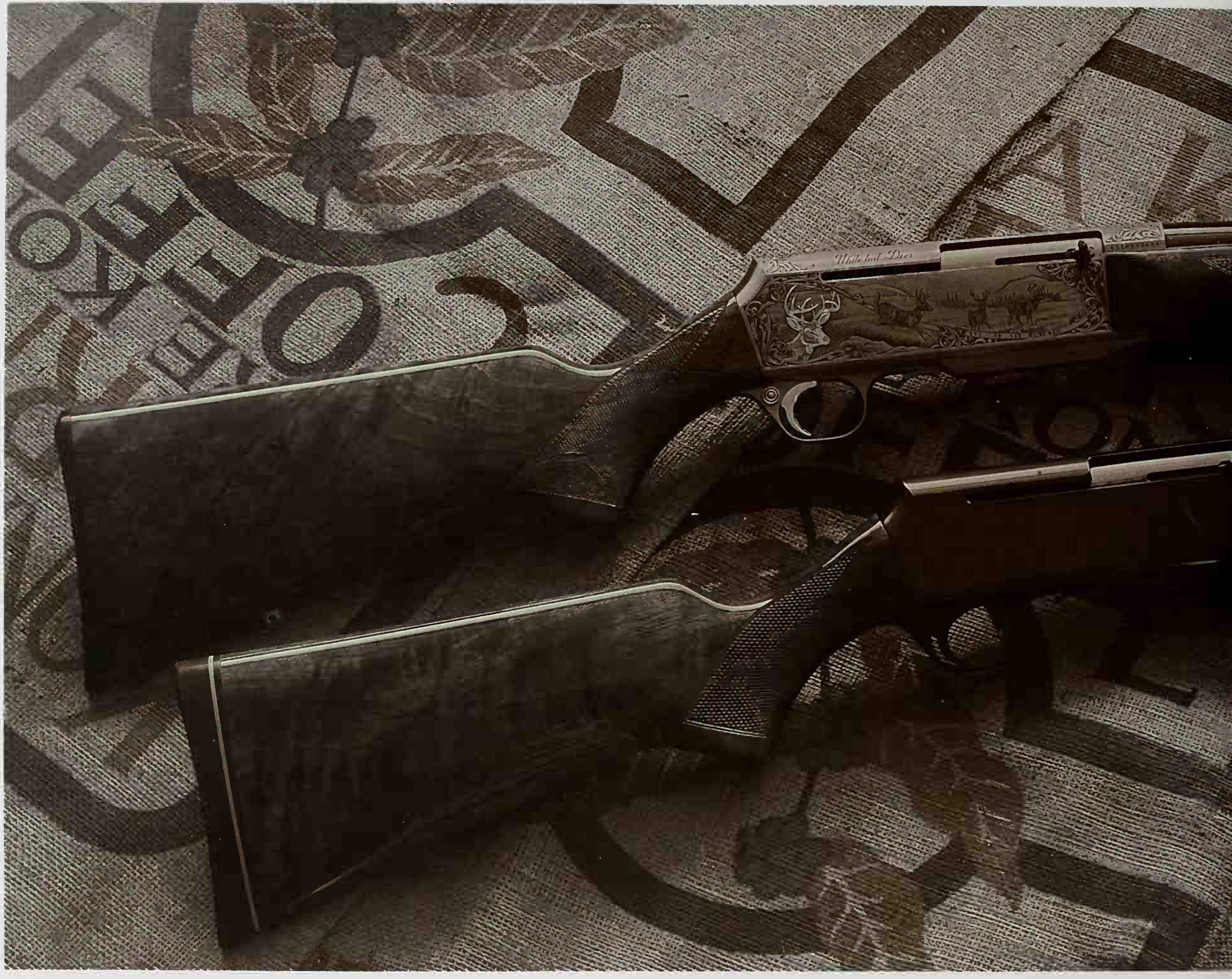
Above: This Presentation One Superposed Shotgun has oak leaf engraving on a silver grey receiver. Embellishing the sides of the receiver are two mallard ducks inlaid in gold. *Below:* This Presentation Two Superposed displays mourning doves in gold inlay on the receiver. The fleur-de-lis design on the receiver is more intricate than the engraving on the Presentation One.





Above: The highly engraved receiver on this Presentation Three Superposed has a gold inlaid border and an English setter flushing a pheasant. *Below:* With its exquisite engraving and high quality finish, the Presentation Four Superposed is gunmaking at its finest. Deep floral carving adorns the receiver, which features a group of waterfowl in gold inlay.





***At top, above and below:* These two guns illustrate the range of custom work. This BAR Big Game has a finely engraved silver grey receiver while the Grade I BAR has a simple, blued receiver.**

and squeeze the trigger. To use the 'set' trigger, the hammer was cocked and the trigger was pushed forward, thus sensitizing it to provide a light let-off that could be preset at between 2 ounces and 2 pounds.

The Mountain Rifle features traditionally-styled adjustable sights, which include a screw adjustment for elevation and drift adjustment for windage, with a sight radius of 21.9 inches, for accurate sighting. The Mountain Rifle is in .45, .50 and .54 caliber, weighs approximately 9.6 pounds and its hooked breech allows the barrel to be easily removed for cleaning. It is complete with a spare nipple and a ramrod of brass-tipped hickory.

Browning's unique, two-piece breech plug system reduces barrel stress and eliminates the danger of pre-ignition due to the presence of residue from previous firings.

The stock of a Jonathan Browning Mountain Rifle is specially selected and seasoned hardwood, finished with a deluxe oil finish and accented with a choice of browned steeled or brass finish on the butt plate, trigger guard and complimentary furniture. The barrel and lock are executed in traditional browned steel finish. A ram's horn on the breech plug adds further distinction to this special edition black powder rifle.

The Limited Edition Waterfowl Superposed Shotguns were featured in Browning's 1980 catalogue. This special edition is devoted to celebrating the mallard duck, and features generous gold inlay life-studies of this regal American bird. Each shotgun in the series has a handsomely gold inlaid and engraved gray steel receiver.

Limited to 500 Belgium-made guns, the edition number of each firearm is written in gold on the bottom of the receiver along with the words 'American Mallard' and that bird's scientific name. Gracing each gun, in 24-karat gold relief against a grayed steel background scene, are the following depictions, which are based on drawings by western wildlife artists Leon Burrows. On the receiver's left side is a quiet pond on a fall morning with a pair of Mallards rising over it. On the receiver's right side, the birds come in over the calm waters of a marsh with wings set for landing. Another pair of Mallards rise to flight on the bottom of the receiver, and the golden head of a drake graces the bottom of the trigger guard.

The stocks of these distinctive firearms are beautifully carved, high grade dark French walnut with a hand-oiled

finish. The forearms feature extremely fine hand checkering, and a distinctive scroll pattern has been cut into the buttstock's rounded pistol grip. A uniquely checkered butt replaces the common or traditional plate. To compliment, display and protect these magnificent firearms, each commemorative Lightning Superposed was provided with a form-fitting, velvet-lined black walnut case.

The Classic and Gold Classic Editions, inaugurated in 1984, have as their focal points three of John M Browning's most appreciated inventions—the Automatic-5, the 9mm Hi-Power Pistol and the Superposed Shotgun.

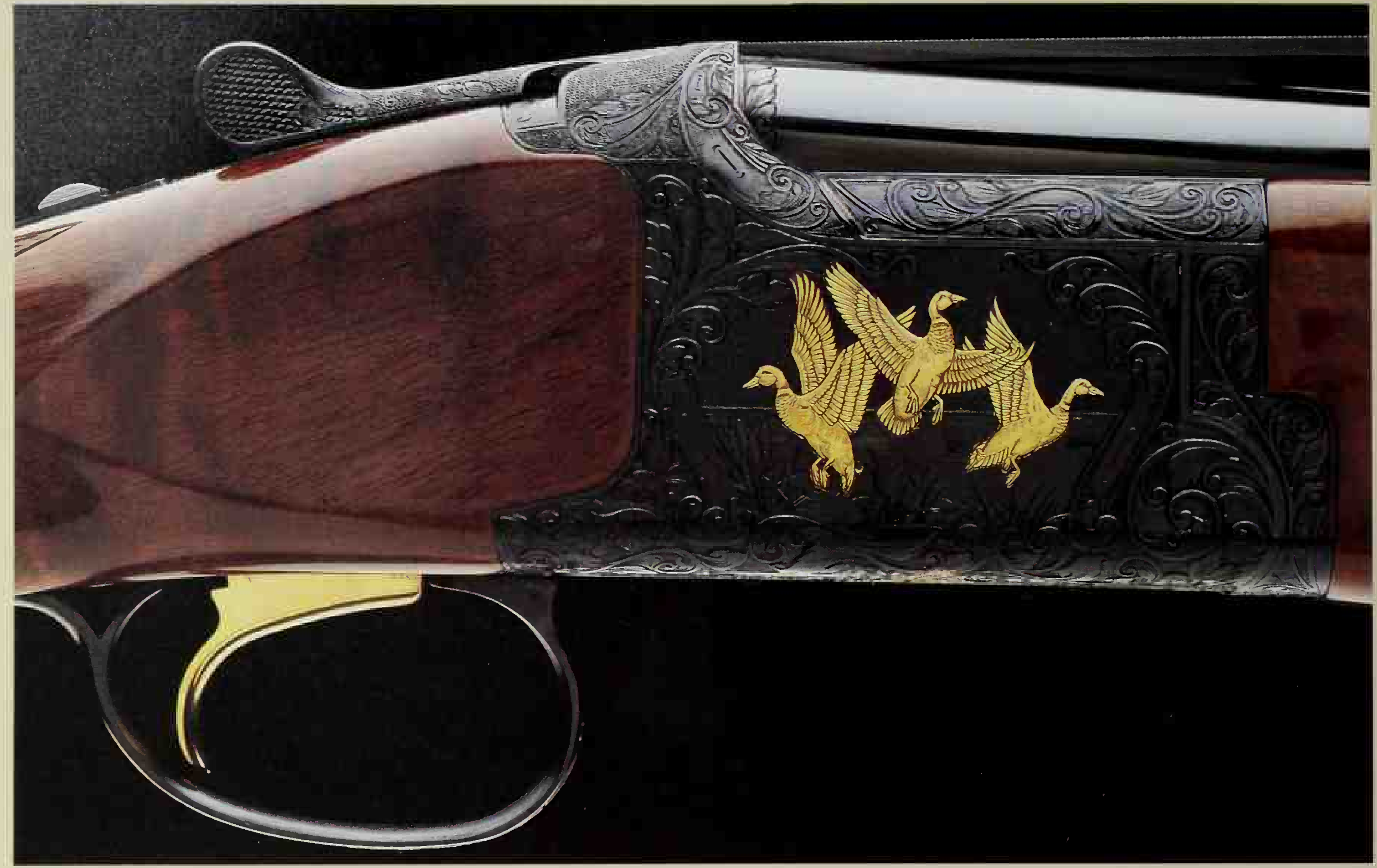
The Classics are limited editions of 5000 units and feature engraved hunting and wildlife scenes on satin gray steel. Each model is individually inscribed with the engraver's name. In a banner across the right side of the receiver on the shotguns, and across the frame on the Hi-Power, are engraved the words, 'Browning Classic.' The left side similarly displays the words 'One of Five Thousand.'

Limited to runs of 500 pieces, the Gold Classics feature engraving similar to the Classics—with the addition of 18 karat gold inlays which include a portrait of John M Browning, the words 'Browning Gold Classic,' the issue number and each of the various wildlife that appear in the engraved tableaux. These engravings and inlays are set against an exquisite background of grayed steel.

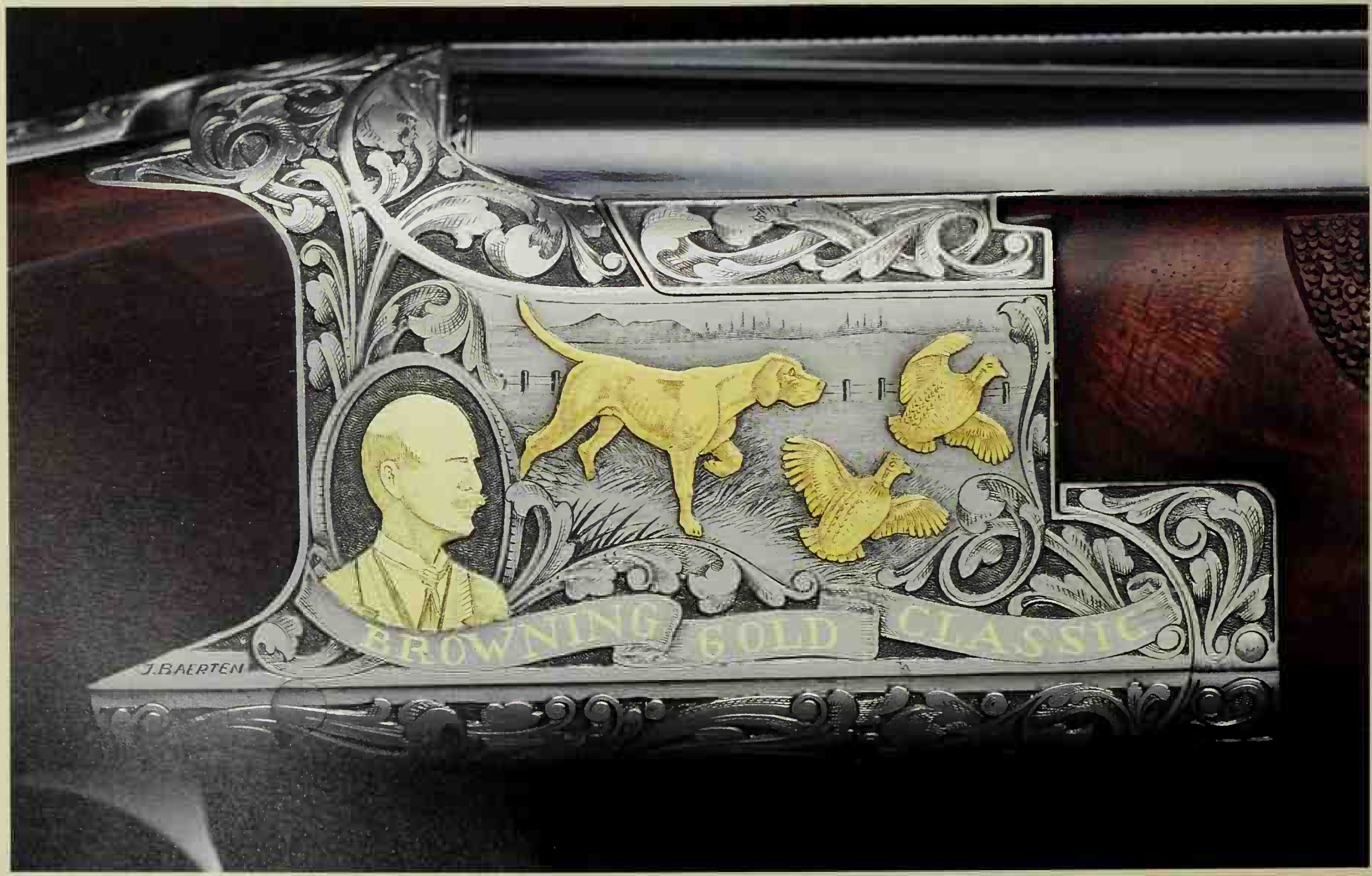
The Auto-5 was technically the first of the Classic and Gold Classic Editions. Its hand-selected, beautifully grained walnut stock and forearm feature a rounded semi-pistol grip that is similar to the traditional style found on early Auto-5s. The right side of the receiver on both Classic and Gold Classic Auto-5 models feature a pair of mallard drakes in flight, with the left displaying a labrador dog retrieving a downed duck.

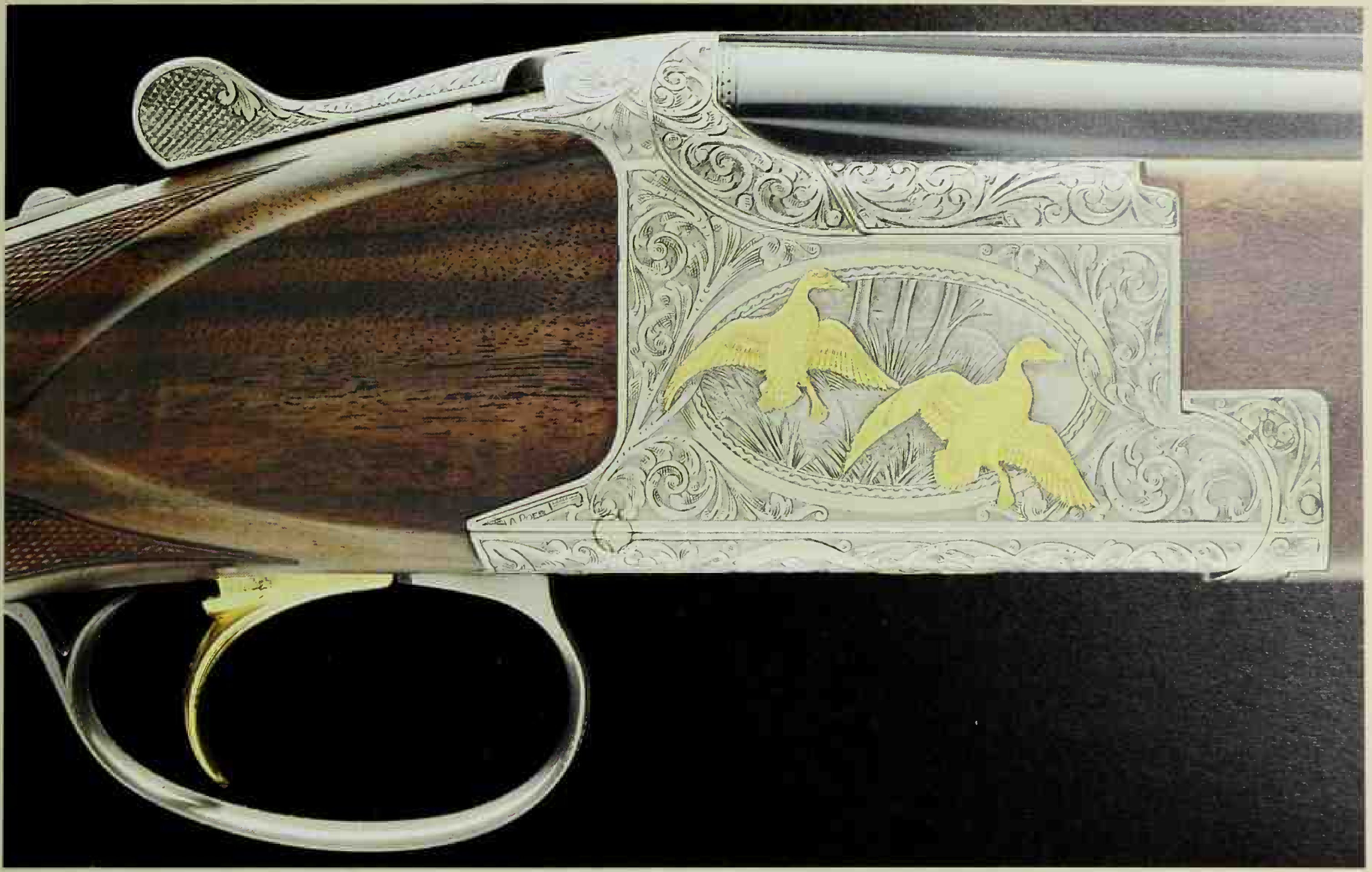
The Classic 9mm Hi-Power Pistol was introduced in 1985. This ornate commemorative pistol features—on the top of its grayed, solid steel slide—an engraving of a bald eagle protecting her young from a lynx. On the pistol's right and left side are engraved profiles of an eagle's head, and the walnut grips have hand cut checkering and detailed, carved scrollwork. The pistol is complete with an attractive, velvet-lined display case.

The Classic and Gold Classic Over and Under Shotguns have hand-selected, highly figured, dense-grained walnut stocks featuring a traditional straight grip, English styling and Schnabel forearm with intricate hand-checkering. The grayed steel receivers on both editions have delicate scroll engravings and game scenes.

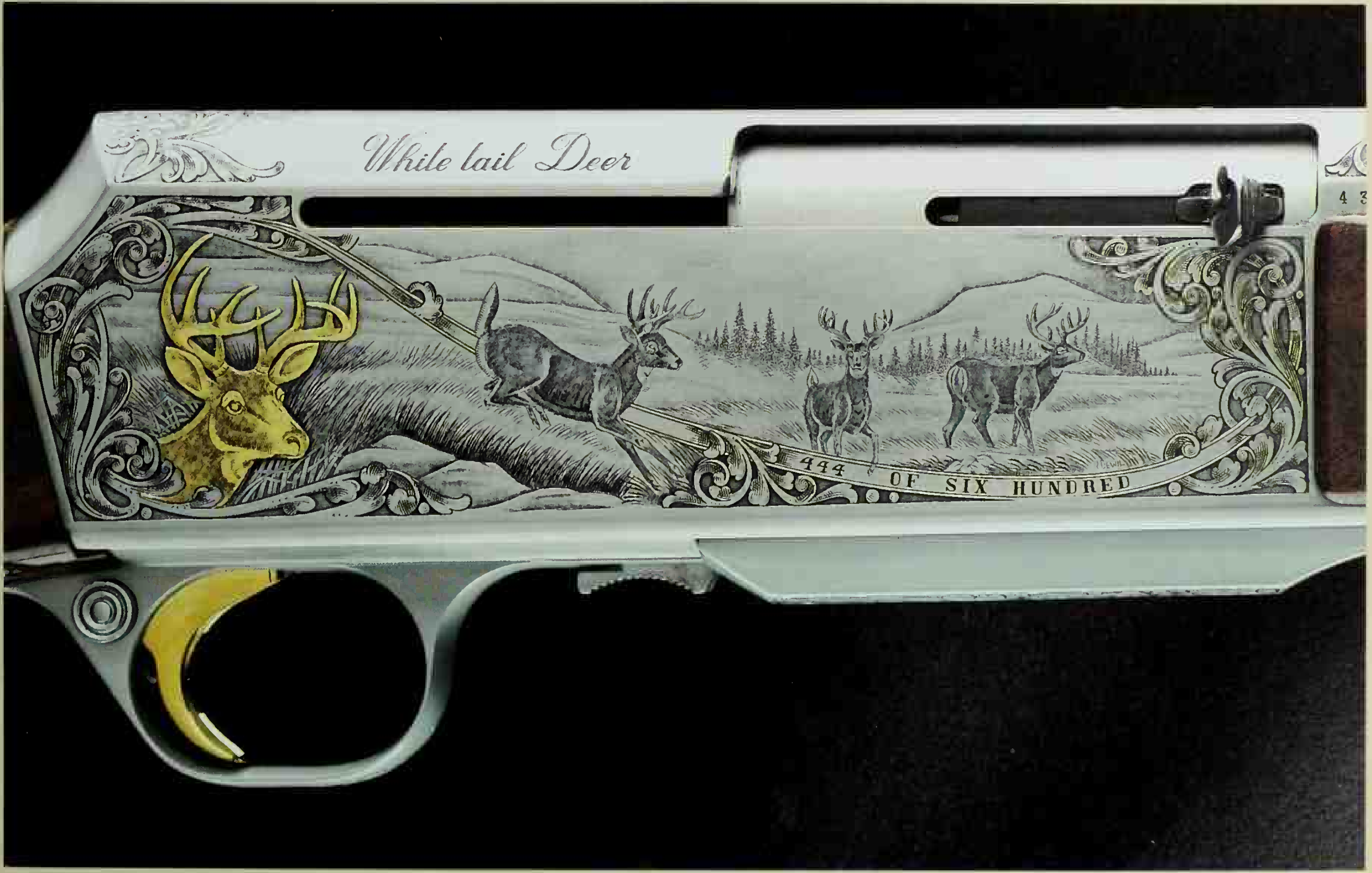


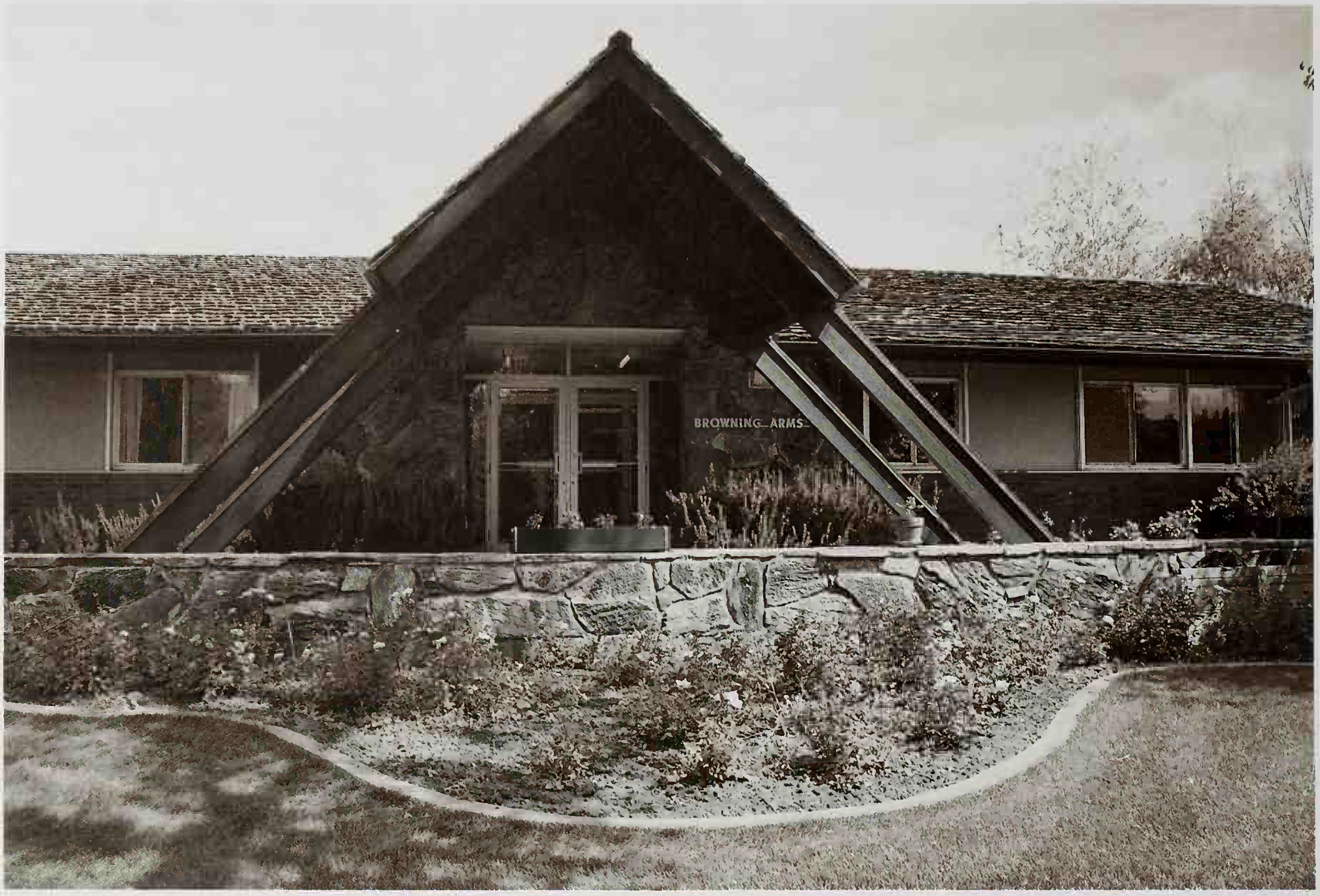
Above: The entire receiver, trigger guard and top tang of this Grade VI Citori feature deep relief engraving. Note that Citori's unique gold plating and engraving process captures an uncannily lifelike image of mallard ducks in flight. *Below:* The Gold Classic Over & Under with its highly figured receiver was made to commemorate the Superposed—John M Browning's last gun design.



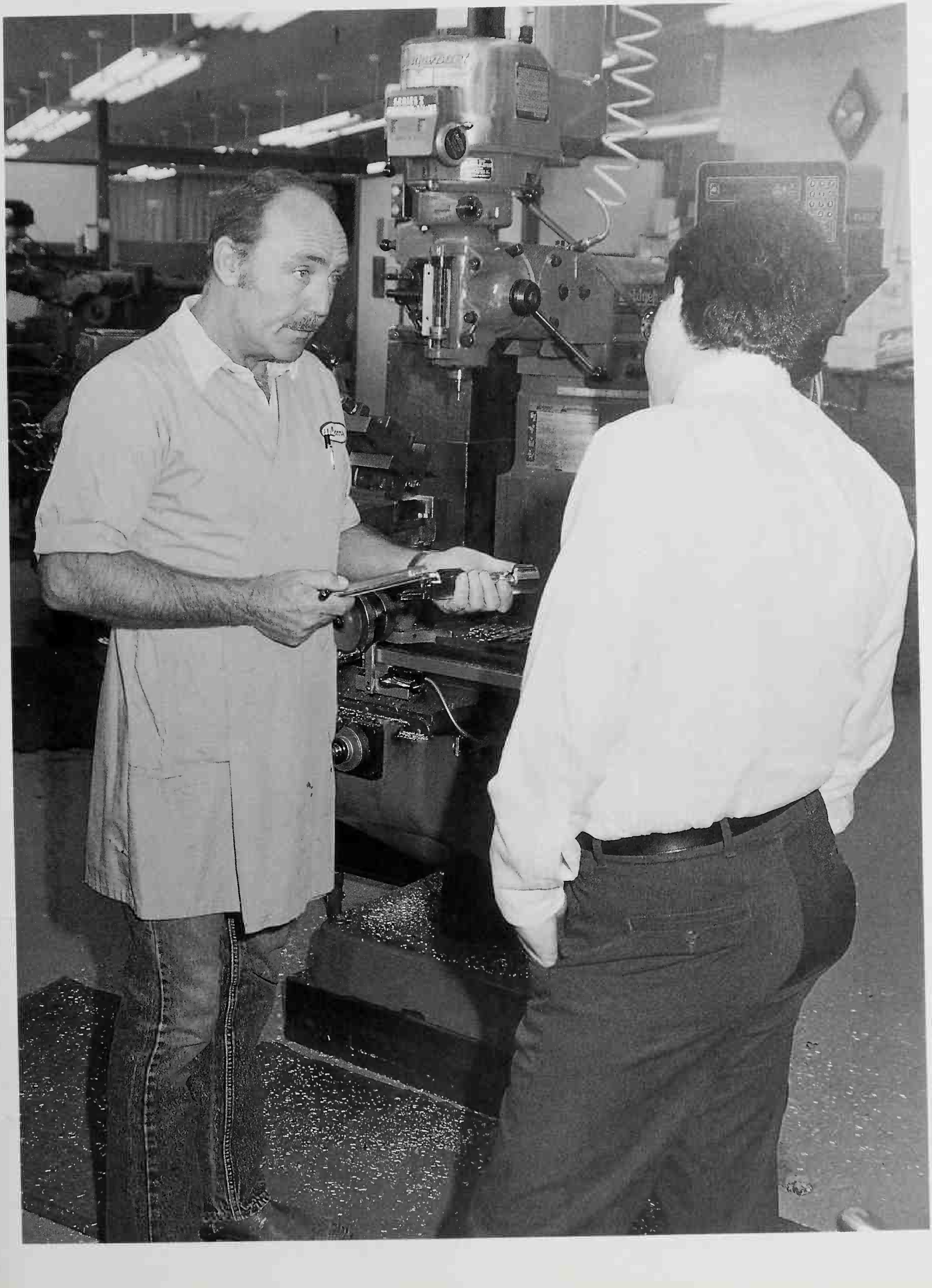


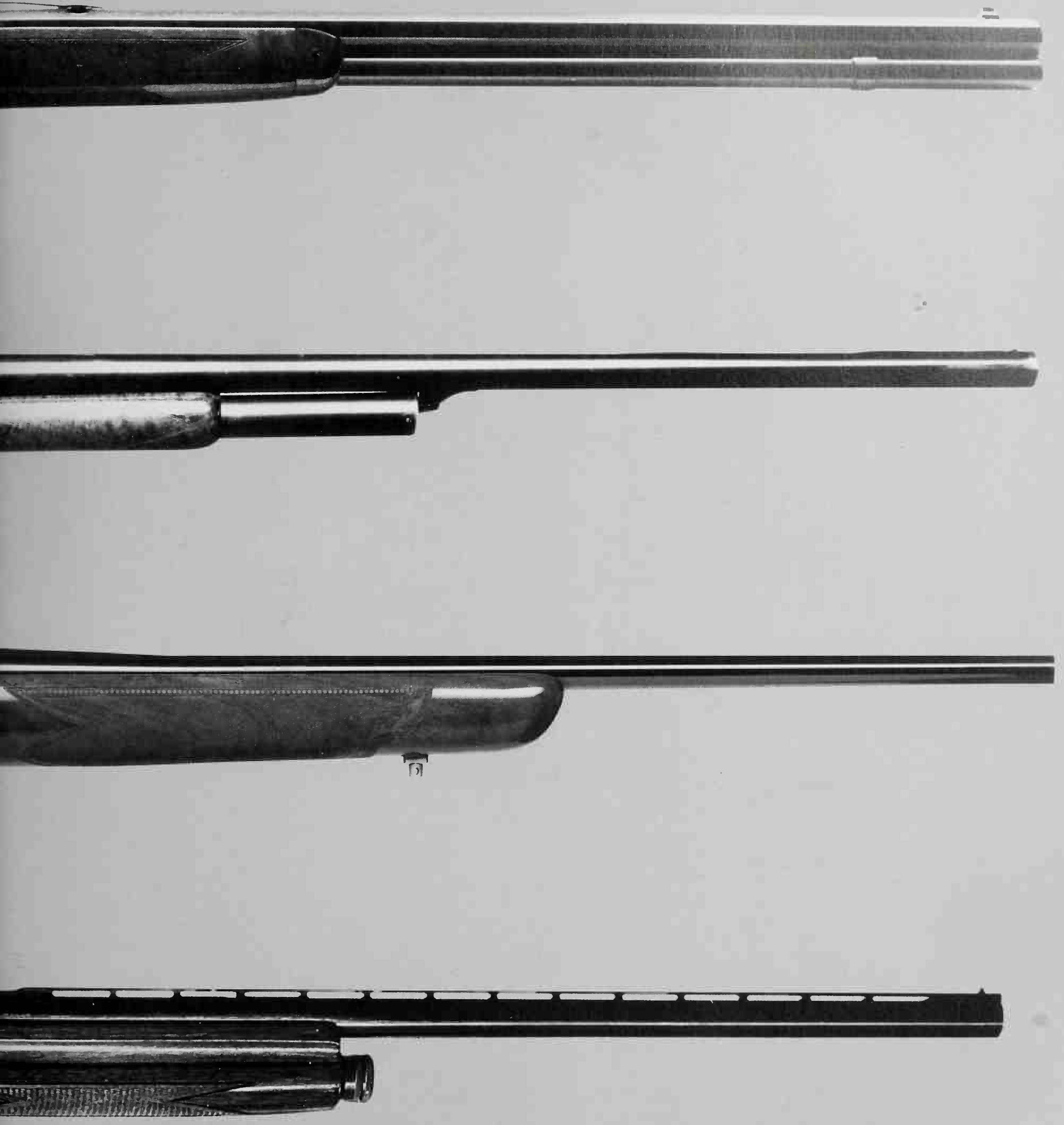
The detailed engraving and gold inlay on the Black Duck Limited Edition Superposed *(above)* and the BAR Big Game Series Limited Edition *(below)* are fine examples of the high quality of firearms embellishment available from Browning's Custom Gun Shop in Belgium.


White tail Deer
444 OF SIX HUNDRED



Above: The headquarters of Browning Arms Company in Morgan, Utah. The machine shop *(below left, below right, opposite)* produces some of the world's finest firearms. Here, the highly skilled workers carry on the tradition of gunmaking that began in the brilliant mind of the most prolific firearms inventor ever known, John Moses Browning. *Overleaf:* These Superposed Shotguns are a testimonial to the Browning tradition.

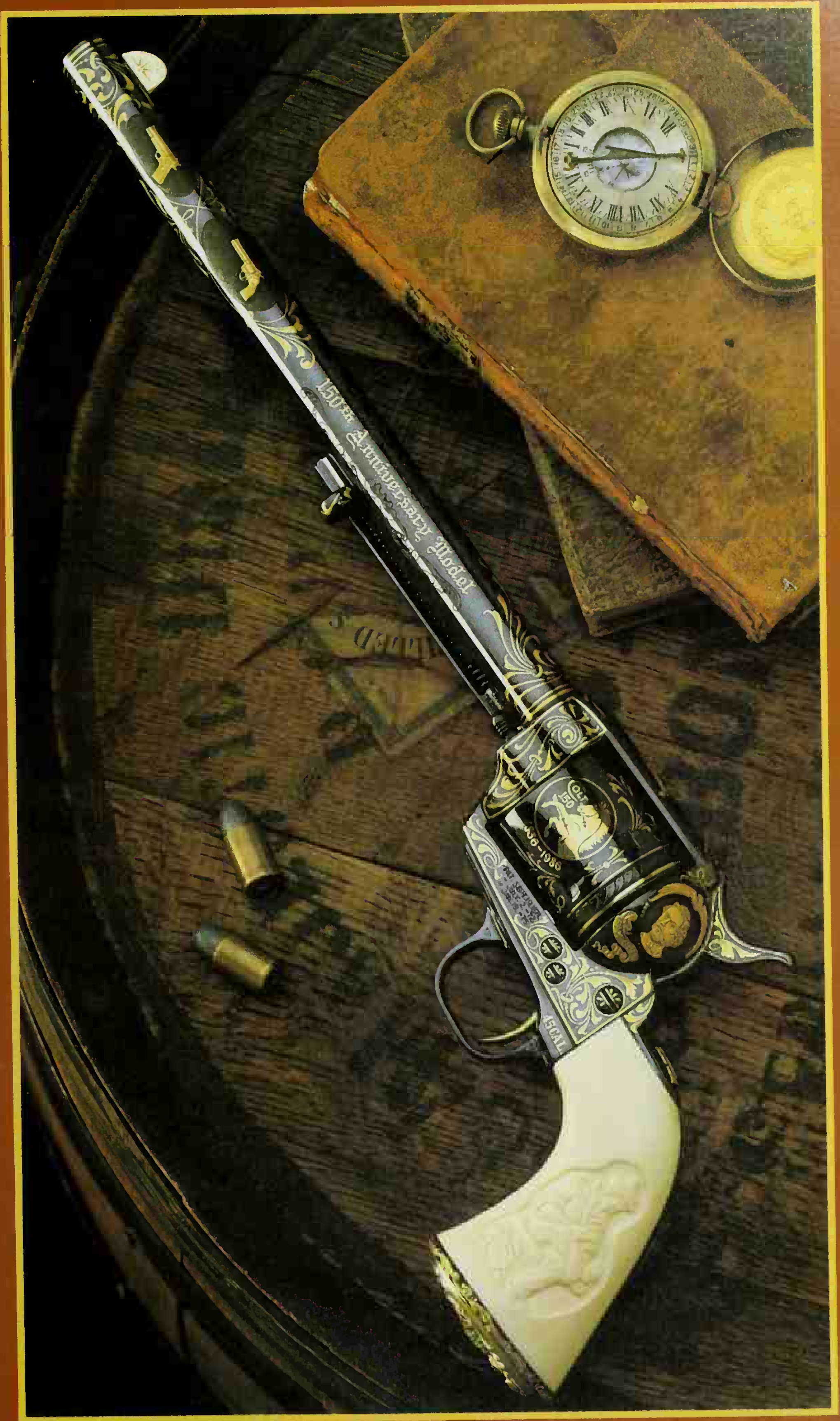




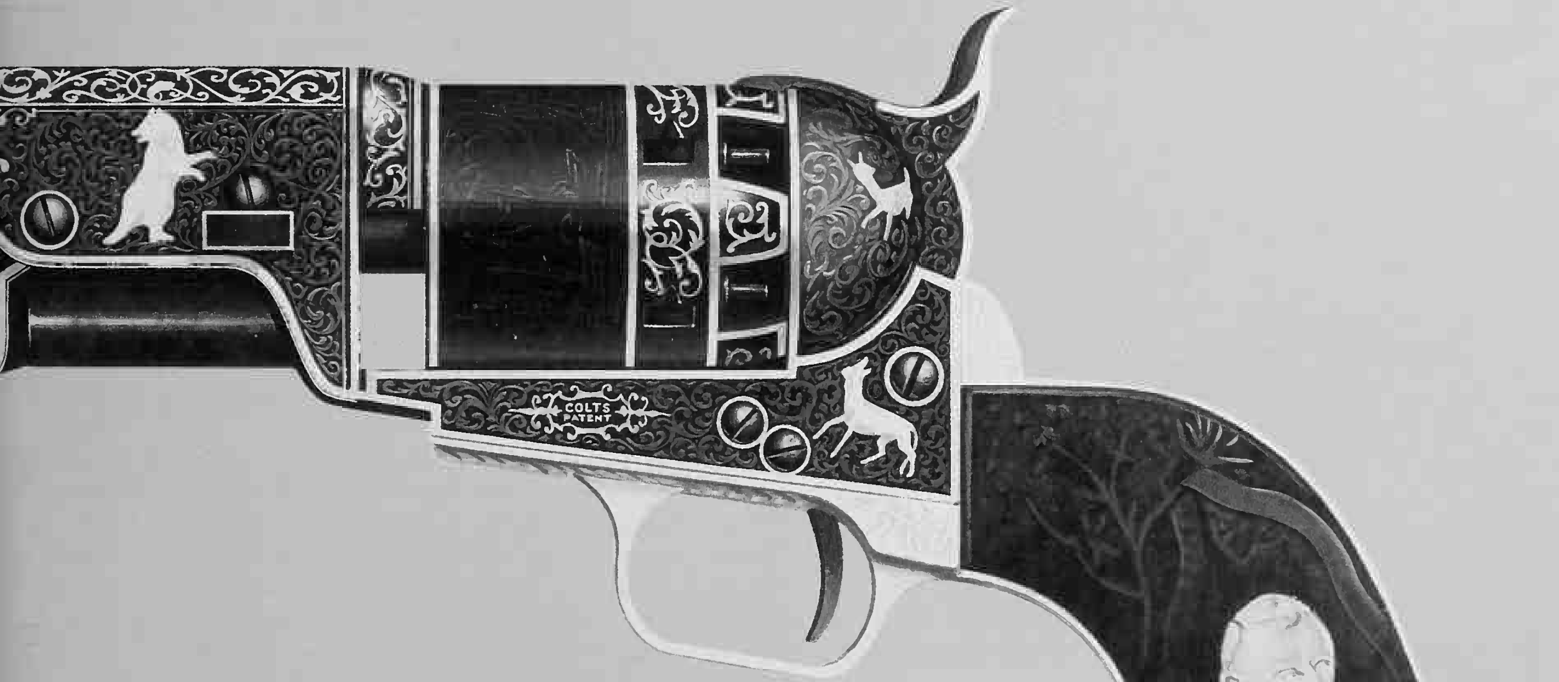
These pages, from top to bottom: **A Winchester Model 1886 lever action, the first Browning design manufactured by Winchester; John Browning's personal trap gun, a Model 1897 pump with leather butt stock cover; a Browning Big Game Series Limited Edition automatic hunting rifle, with custom engraving; and a Browning automatic shotgun in 16 gauge with a 26-inch ventilated rib barrel, made in Belgium by Fabrique Nationale.**

America's Premier Gunmakers

COLT


150th Anniversary Model

Previous pages: **The Colt 150th Anniversary Gun, a Single Action Army Revolver with a Buntline-length barrel in .45 caliber, featuring luxuriant engraving and inlay work. Completed in time for the Anniversary in 1986, the firearm went on exhibition for the year, and was then auctioned for a whopping $150,000!** ***These pages, from top to bottom:*** **Presentation-grade Colts: A hammerless automatic pistol, circa 1940; an Old Model Navy percussion cap revolver of the pre-Civil War era; and a Number One Deringer, circa 1870.**



The Arms of

Samuel Colt was born in Hartford, Connecticut on 19 July 1814, the son of Christopher and Sarah Caldwell Colt. Samuel was naturally inquisitive. Apparently, between the ages of seven and 16, he owned several pistols and took them apart to discover the details of their mechanism. Later in life, he attended the Academy of Amherst, but his education there was cut suddenly off—due to his experimentations with torpedo designs, which quickly got him into trouble with the authorities. Samuel's father, Christopher, ran a dye shop. Samuel helped out in the shop and this experience, no doubt, gave him a grounding in chemistry and metallurgy.

On 2 August 1830, Samuel, then a boy of 16, sailed on the ship *Corlo*, bound from Boston to Calcutta, India. It was while on this voyage that Colt, watching the ship's wheel and noting both its rotation and its alignments, conceived the use of the revolving cylinder in a firearm. His concepts were then carved into a wooden model of a pistol resembling the 'pepperbox' type of revolver. On his return, Samuel Colt introduced his idea to Mr Anson Chese, who by trade was a gunsmith. From drawings and the wooden model whittled out on the *Corlo*, an all metal model pistol was produced in 1832.

This first pistol model actually blew up in Colt's hand when he tried to fire it. A new model followed, much improved over the first. That second model contained basically three elements that were to make Colt famous. The three elements were: the rotation of a mini-chambered breech in a single-barreled firearm by the action of cocking the hammer; the locking of the cylinder into place in front of the barrel; and the placing of partitions between the bores of the breech, this to insure that when the pistol fired that only one chamber at a time went off.

Colt had a great idea, but he had no money. At one time his father had been well off, but the family dye business had lost money when Colt was very young—his father could be of no help to him. So in 1832, Colt embarked on a lecture tour of the United States and Canada in which he gave lectures on and demonstrations of nitrous oxide or 'laughing gas.' He knew how to draw an audience, and how to keep their attention, if not their complete sanity. He changed the spelling of his name to Coult and inserted the title Doctor in front of it. This, in combination with the novel nature of nitrous oxide, brought him immediate and considerable success.

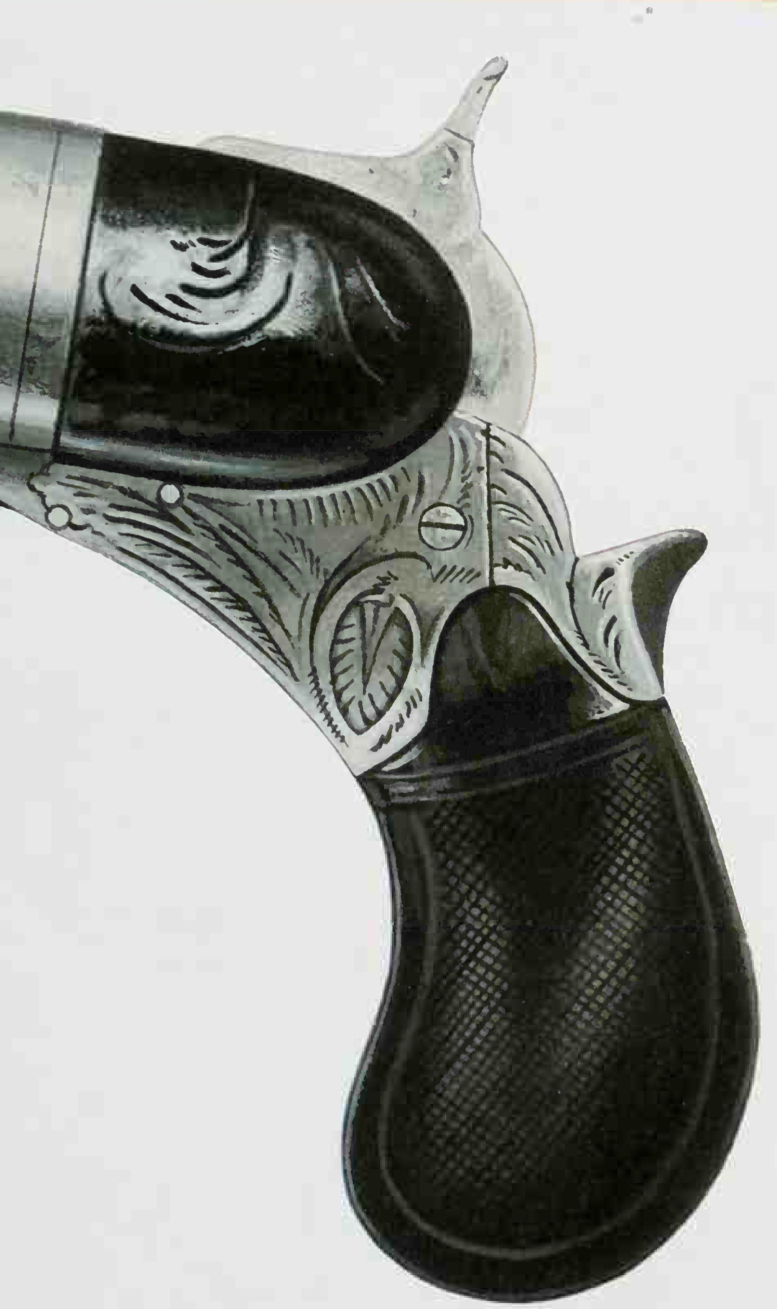
These antics with laughing gas were, however, only a part of a larger scheme. Colt never forgot that his prime motivation was money to produce his pistols. Various models were produced in 1832, 1833 and 1834, and finally in 1835, Colt quit the lecture circuit and went to Europe where he took out patents in both England and France for his pistols. He returned to America, and US patents were finally granted him on 25 February 1936.

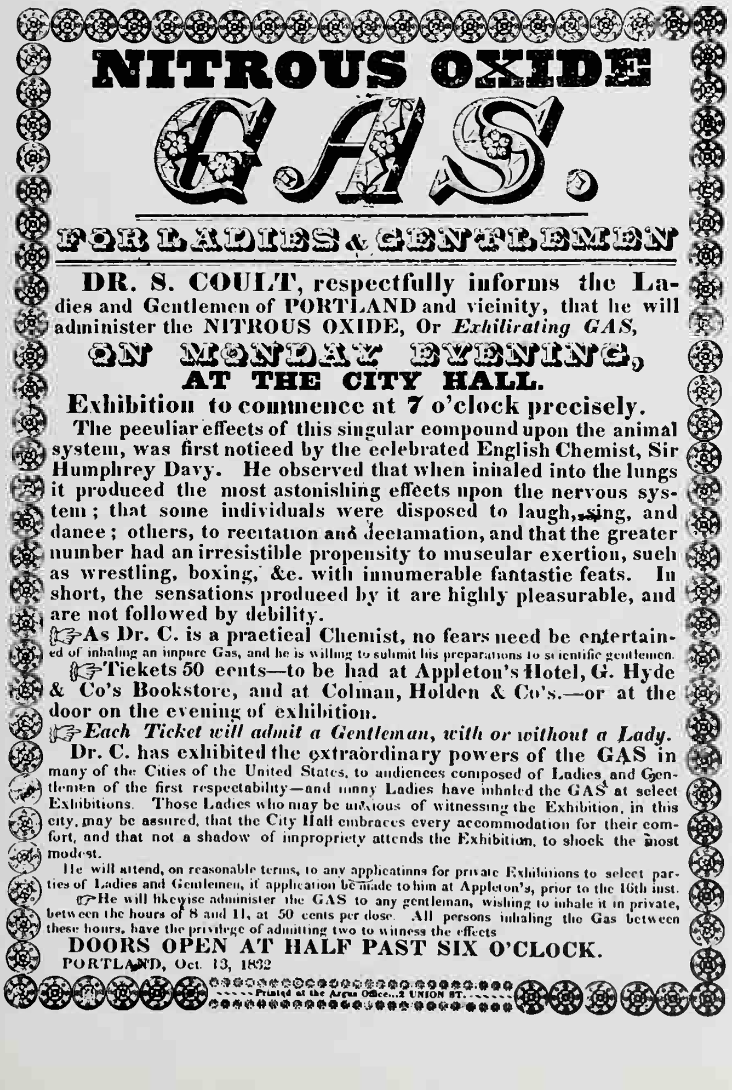
Based on these patents and the unique designs of these firearms, a new company was formed. The 'Patent Arms Manufacturing Company of Paterson, New Jersey, Colt's Patent' was formed in 1836; $150,000 in stock was sold in order to finance the company, and Colt himself received in payment for his services between one and two dollars for each pistol that was manufactured. This company is referred to in firearms history as the Paterson factory. It commenced its operations with high hopes in 1836, went into bankruptcy in 1841 and closed permanently in 1842. But it was a beginning.

From the Paterson factory came the first promotion model revolver. It was a .40 caliber five shot pistol, with a barrel length of 3.25 inches. This was the first Colt revolver and it was produced in 1835. It is interesting to note that this small gun had a forestock made of wood—to make the gun resemble as closely as possible the standard flintlock guns of its time.

Some interesting methods of determining the number of firearms produced in a factory where no exact records exist are employed by firearms collectors and enthusiasts. A particular model of firearm with a known production number is compared to the firearm without known production num-

Samuel Colt





NITROUS OXIDE

GAS.

FOR LADIES & GENTLEMEN

DR. S. COULT, respectfully informs the Ladies and Gentlemen of PORTLAND and vicinity, that he will administer the NITROUS OXIDE, Or *Exhilirating GAS*,

ON MONDAY EVENING,

AT THE CITY HALL.

Exhibition to commence at 7 o'clock precisely.

The peculiar effects of this singular compound upon the animal system, was first noticed by the celebrated English Chemist, Sir Humphrey Davy. He observed that when inhaled into the lungs it produced the most astonishing effects upon the nervous system; that some individuals were disposed to laugh, sing, and dance; others, to recitation and declamation, and that the greater number had an irresistible propensity to muscular exertion, such as wrestling, boxing, &c. with innumerable fantastic feats. In short, the sensations produced by it are highly pleasurable, and are not followed by debility.

☞As Dr. C. is a practical Chemist, no fears need be entertained of inhaling an impure Gas, and he is willing to submit his preparations to scientific gentlemen.

☞Tickets 50 cents—to be had at Appleton's Hotel, G. Hyde & Co's Bookstore, and at Colman, Holden & Co's.—or at the door on the evening of exhibition.

☞*Each Ticket will admit a Gentleman, with or without a Lady.*

Dr. C. has exhibited the extraordinary powers of the GAS in many of the Cities of the United States, to audiences composed of Ladies and Gentlemen of the first respectability—and many Ladies have inhaled the GAS at select Exhibitions. Those Ladies who may be anxious of witnessing the Exhibition, in this city, may be assured, that the City Hall embraces every accommodation for their comfort, and that not a shadow of impropriety attends the Exhibition, to shock the most modest.

He will attend, on reasonable terms, to any applications for private Exhibitions to select parties of Ladies and Gentlemen, if application be made to him at Appleton's, prior to the 16th inst.

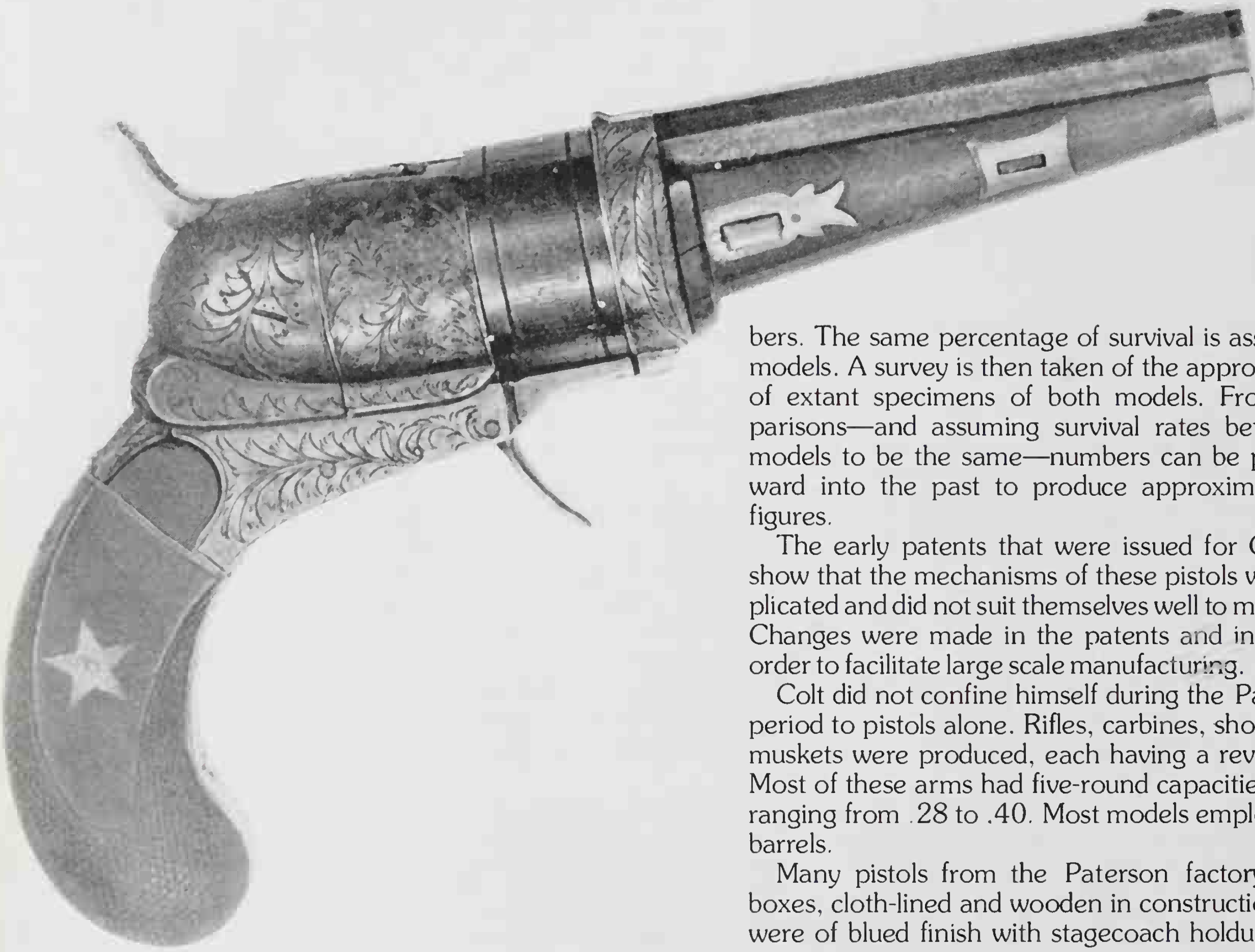
☞He will likewise administer the GAS to any gentleman, wishing to inhale it in private, between the hours of 8 and 11, at 50 cents per dose. All persons inhaling the Gas between these hours, have the privilege of admitting two to witness the effects

DOORS OPEN AT HALF PAST SIX O'CLOCK.

PORTLAND, Oct. 13, 1832

Printed at the Argus Office...2 UNION ST.

At left: Lacking money to manufacture his guns, Samuel Colt, posing as the mysterious 'Dr S Coult,' embarked on a series of nitrous oxide demonstrations to raise the necessary cash. This flyer advertises 'Dr Coult's' presentation. *Above:* This is one of the experimental models Colt had made between 1832–1835, before he took out patents and before the Paterson factory was built.

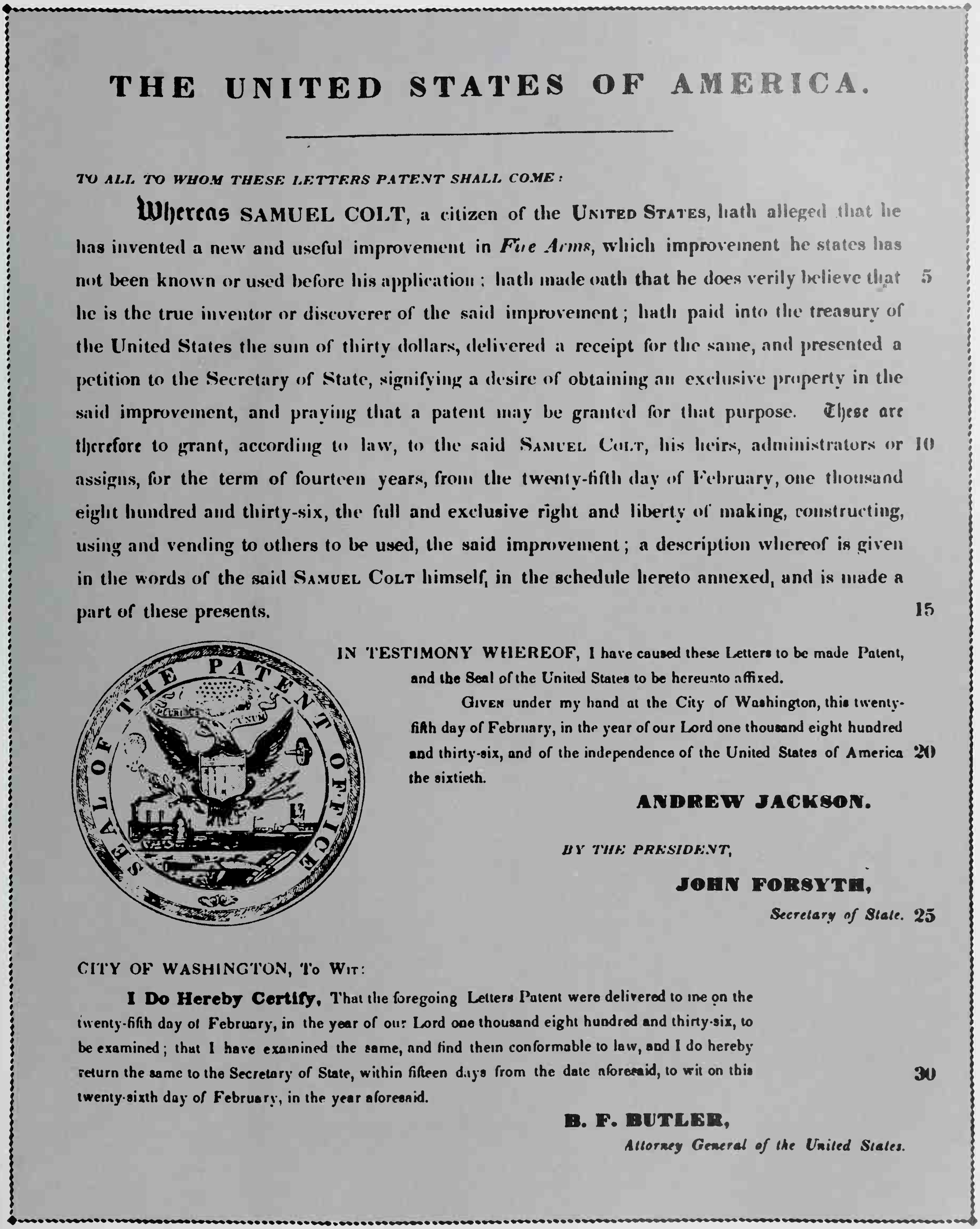


bers. The same percentage of survival is assumed for both models. A survey is then taken of the approximate number of extant specimens of both models. From these comparisons—and assuming survival rates between the two models to be the same—numbers can be projected backward into the past to produce approximate production figures.

The early patents that were issued for Colt's revolvers show that the mechanisms of these pistols were quite complicated and did not suit themselves well to mass production. Changes were made in the patents and in the designs in order to facilitate large scale manufacturing.

Colt did not confine himself during the Paterson factory period to pistols alone. Rifles, carbines, shotguns and even muskets were produced, each having a revolving cylinder. Most of these arms had five-round capacities, with calibers ranging from .28 to .40. Most models employed octagonal barrels.

Many pistols from the Paterson factory were sold in boxes, cloth-lined and wooden in construction. The barrels were of blued finish with stagecoach holdup scenes being



THE UNITED STATES OF AMERICA.

TO ALL TO WHOM THESE LETTERS PATENT SHALL COME:

Whereas SAMUEL COLT, a citizen of the UNITED STATES, hath alleged that he has invented a new and useful improvement in *Fire Arms*, which improvement he states has not been known or used before his application; hath made oath that he does verily believe that he is the true inventor or discoverer of the said improvement; hath paid into the treasury of the United States the sum of thirty dollars, delivered a receipt for the same, and presented a petition to the Secretary of State, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose. These are therefore to grant, according to law, to the said SAMUEL COLT, his heirs, administrators or assigns, for the term of fourteen years, from the twenty-fifth day of February, one thousand eight hundred and thirty-six, the full and exclusive right and liberty of making, constructing, using and vending to others to be used, the said improvement; a description whereof is given in the words of the said SAMUEL COLT himself, in the schedule hereto annexed, and is made a part of these presents.

SEAL OF THE PATENT OFFICE

IN TESTIMONY WHEREOF, I have caused these Letters to be made Patent, and the Seal of the United States to be hereunto affixed.

GIVEN under my hand at the City of Washington, this twenty-fifth day of February, in the year of our Lord one thousand eight hundred and thirty-six, and of the independence of the United States of America the sixtieth.

ANDREW JACKSON.

BY THE PRESIDENT,

JOHN FORSYTH,
Secretary of State.

CITY OF WASHINGTON, To WIT:

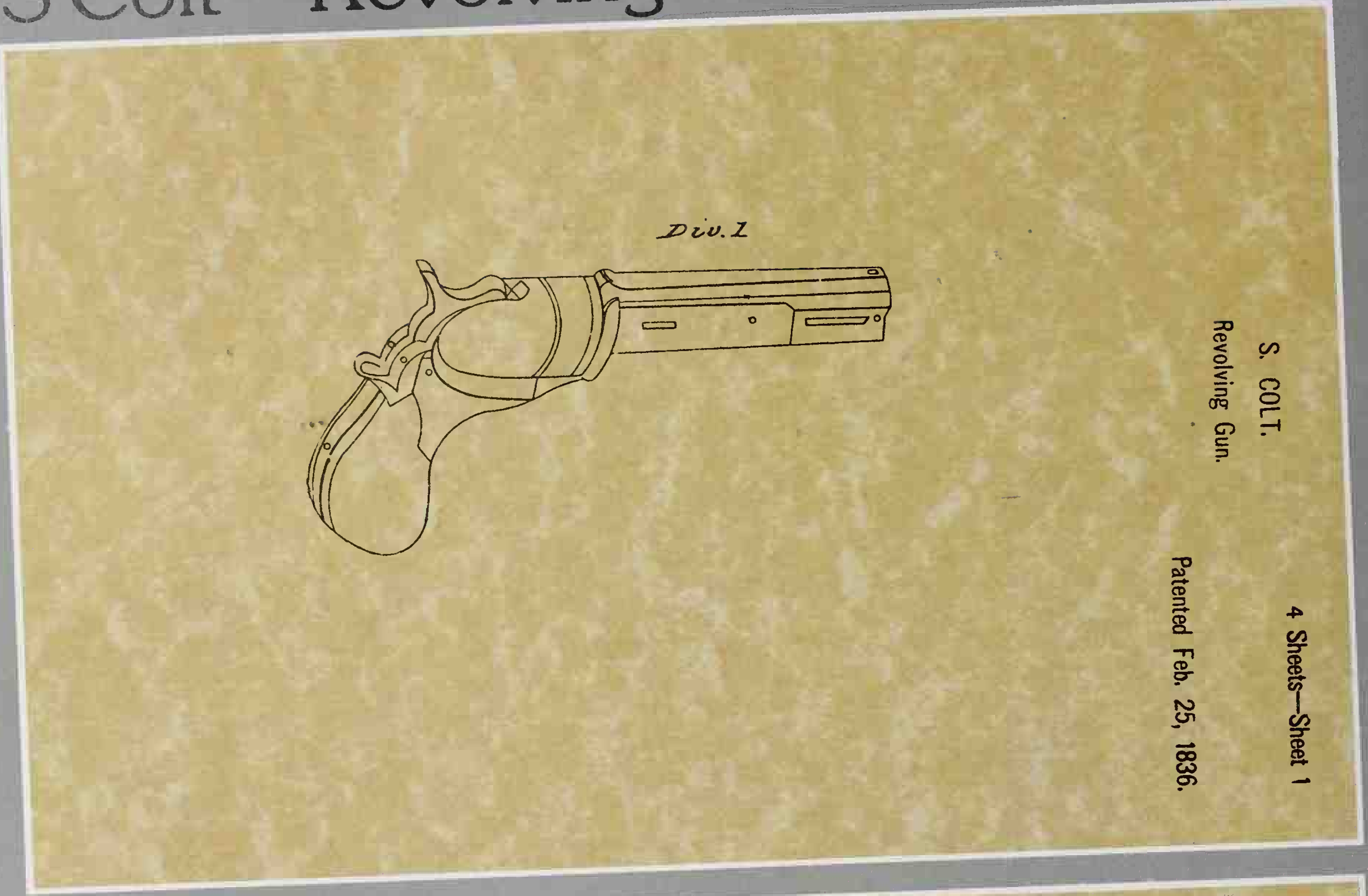
I Do Hereby Certify, That the foregoing Letters Patent were delivered to me on the twenty-fifth day of February, in the year of our Lord one thousand eight hundred and thirty-six, to be examined; that I have examined the same, and find them conformable to law, and I do hereby return the same to the Secretary of State, within fifteen days from the date aforesaid, to wit on this twenty-sixth day of February, in the year aforesaid.

B. F. BUTLER,
Attorney General of the United States.

Above opposite: The Paterson factory, which opened in 1836 and closed in 1842. *Opposite:* This Promotion Model Revolver, made in 1835, was supposed to have been used in selling stock for Colt's new company. *Above:* Preamble to Patent 138, issued on 25 February 1836.

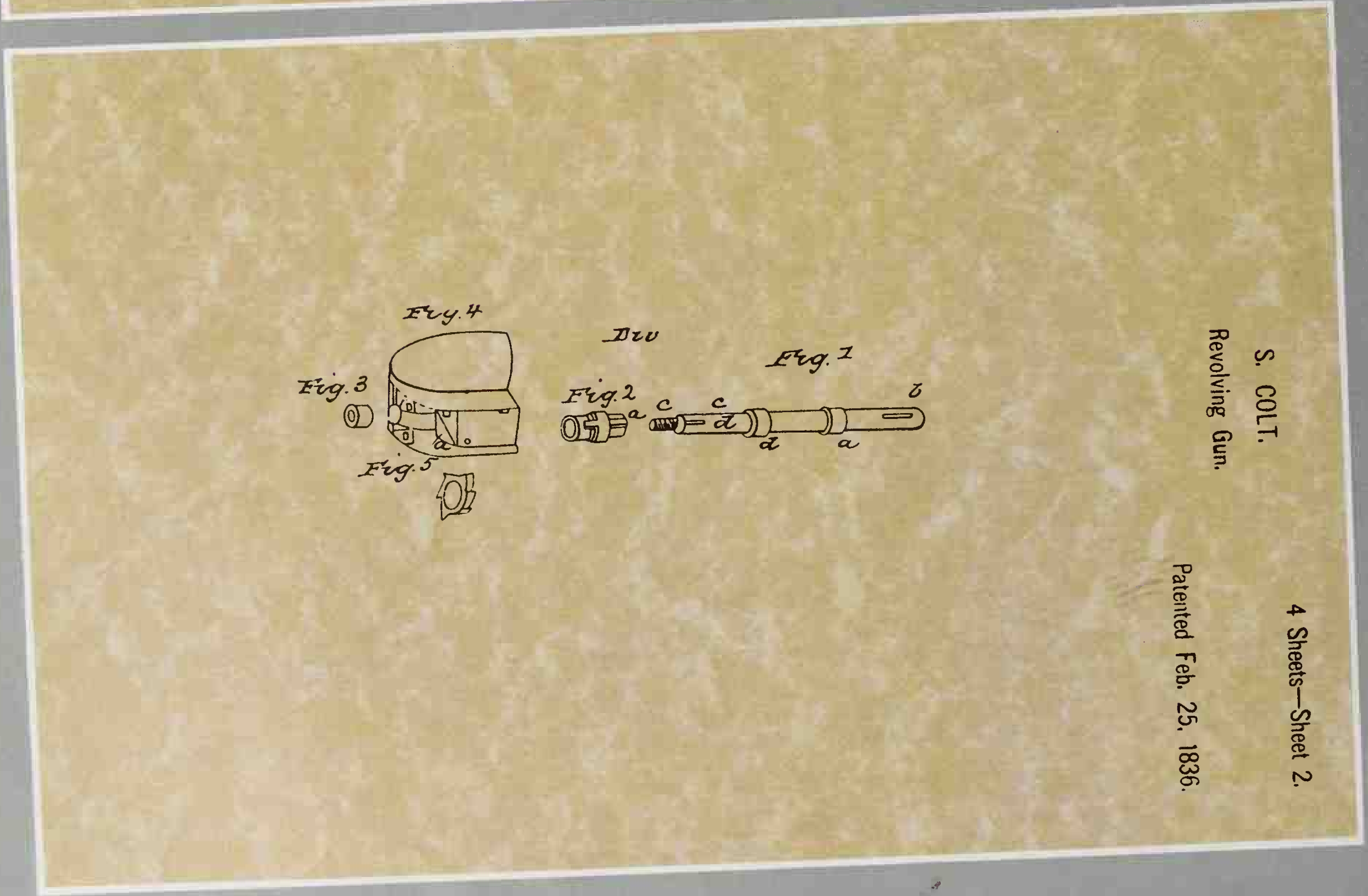
Overleaf: Clockwise from upper left: A patent drawing for Colt's Revolving Gun, patented 25 February 1836; an exploded view of the same; Colt's Revolving Gun designs for (above) pistol and (below) rifle versions; and a view of Colt's cylinder mechanism.

S Colt—Revolving Gun Patent



S. COLT.
Revolving Gun.

4 Sheets—Sheet 1
Patented Feb. 25, 1836.

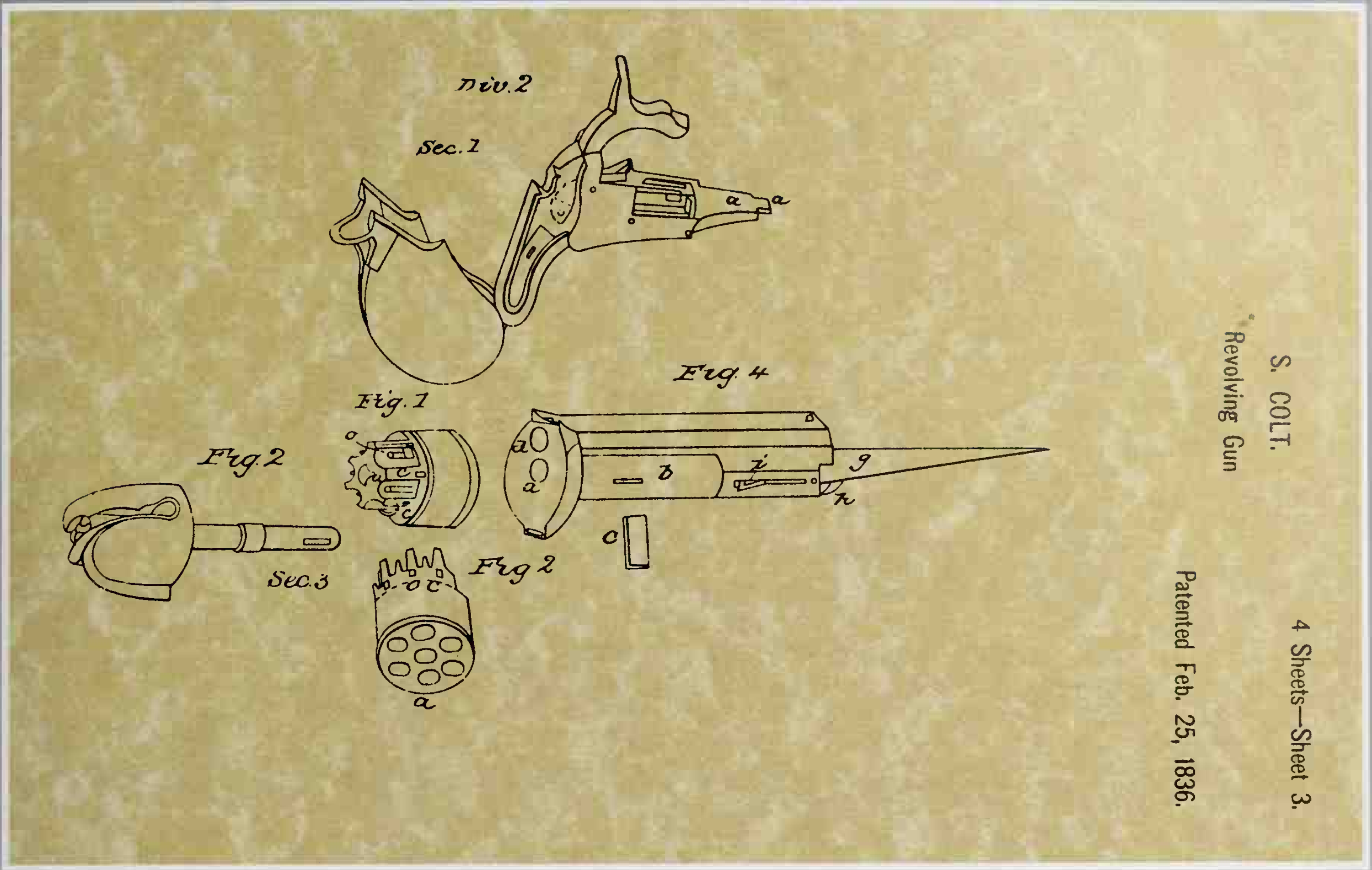


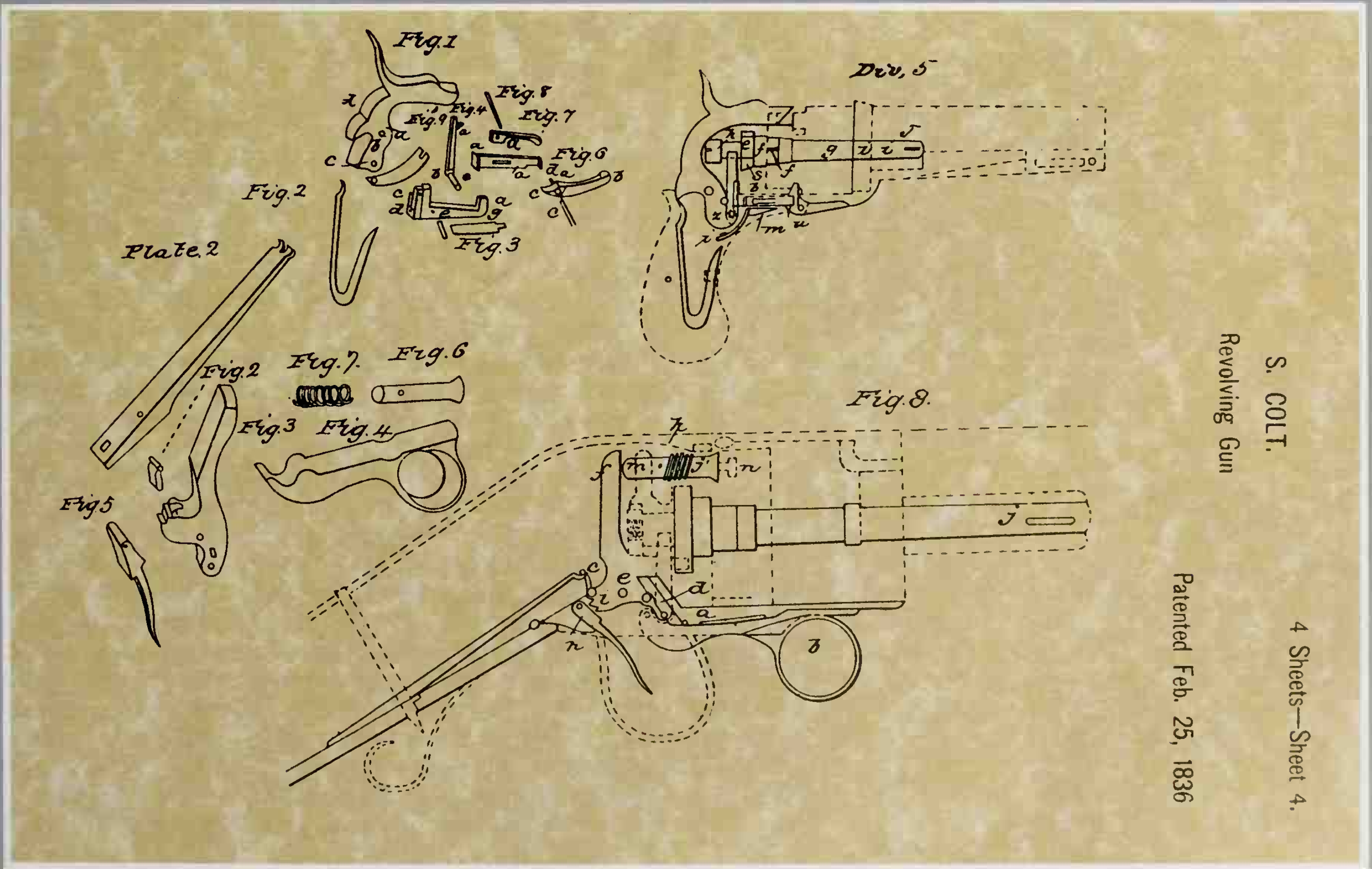
S. COLT.
Revolving Gun.

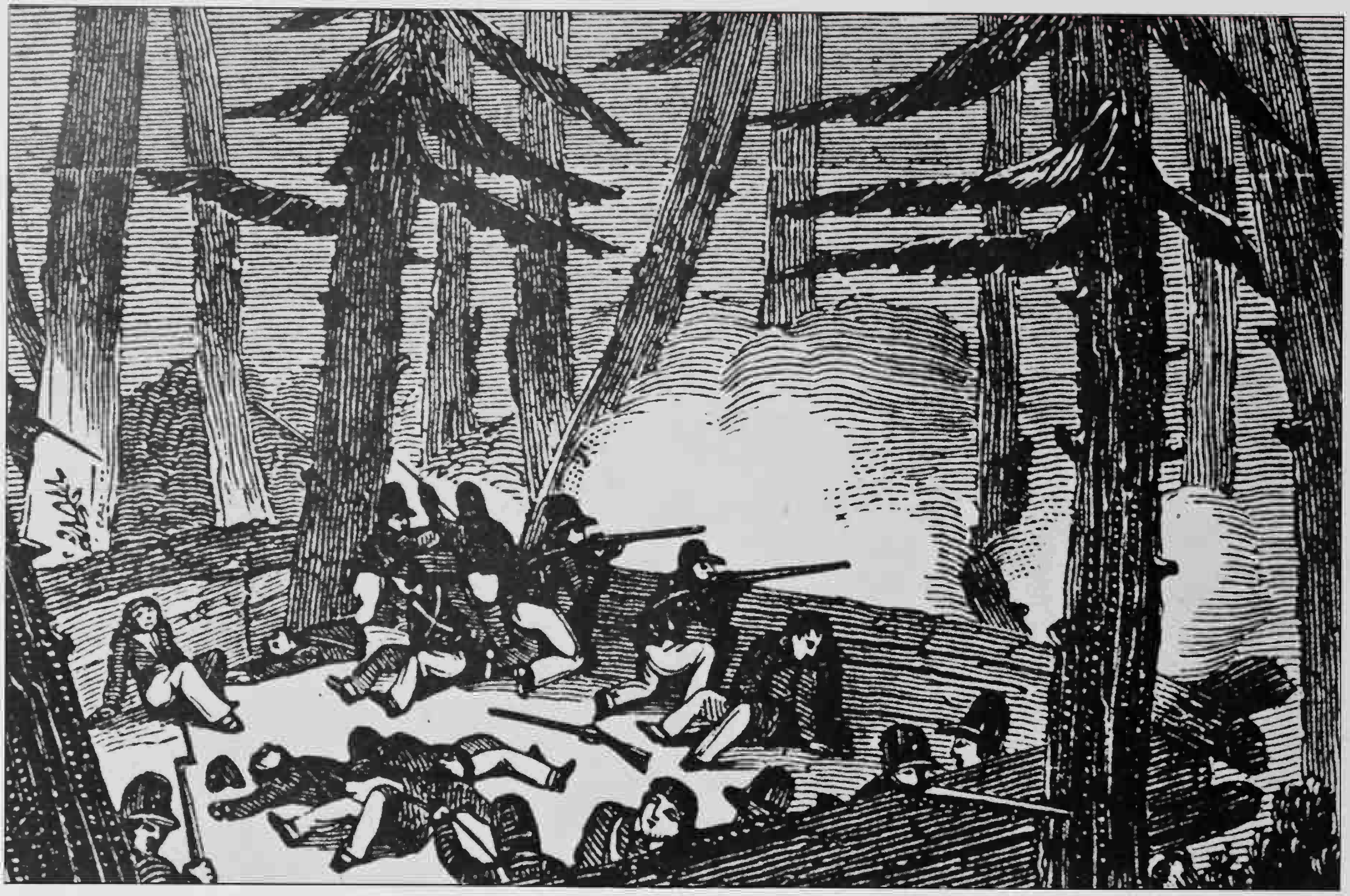
4 Sheets—Sheet 2.
Patented Feb. 25, 1836.

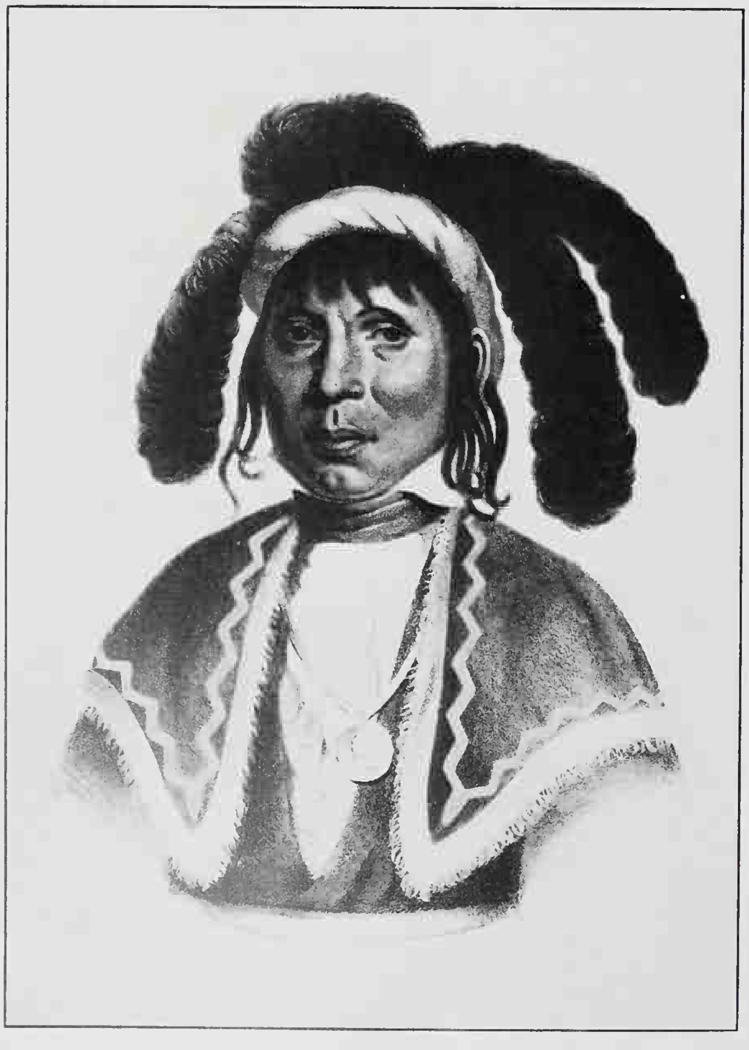
Fig. 4
Div
Fig. 1
Fig. 3
Fig. 2
a
c
c
b
d
d
a
a
Fig. 5

No138, 25Feb1836


S. COLT.
Revolving Gun
4 Sheets—Sheet 3.
Patented Feb. 25, 1836.
Div.2
Sec.1
a
a
Fig.1
Fig.4
Fig.2
Sec.3
Fig 2
a
b
c
g
i
p


S. COLT.
Revolving Gun
4 Sheets—Sheet 4.
Patented Feb. 25, 1836
Fig.1
Fig.8
Fig.4
Fig.9
Fig.7
Fig.6
Fig.2
Fig.3
Div.5
Plate.2
Fig.2
Fig.7.
Fig.6
Fig.3
Fig.4
Fig5
Fig.8
p
J
b
a
d
e
c
n
f





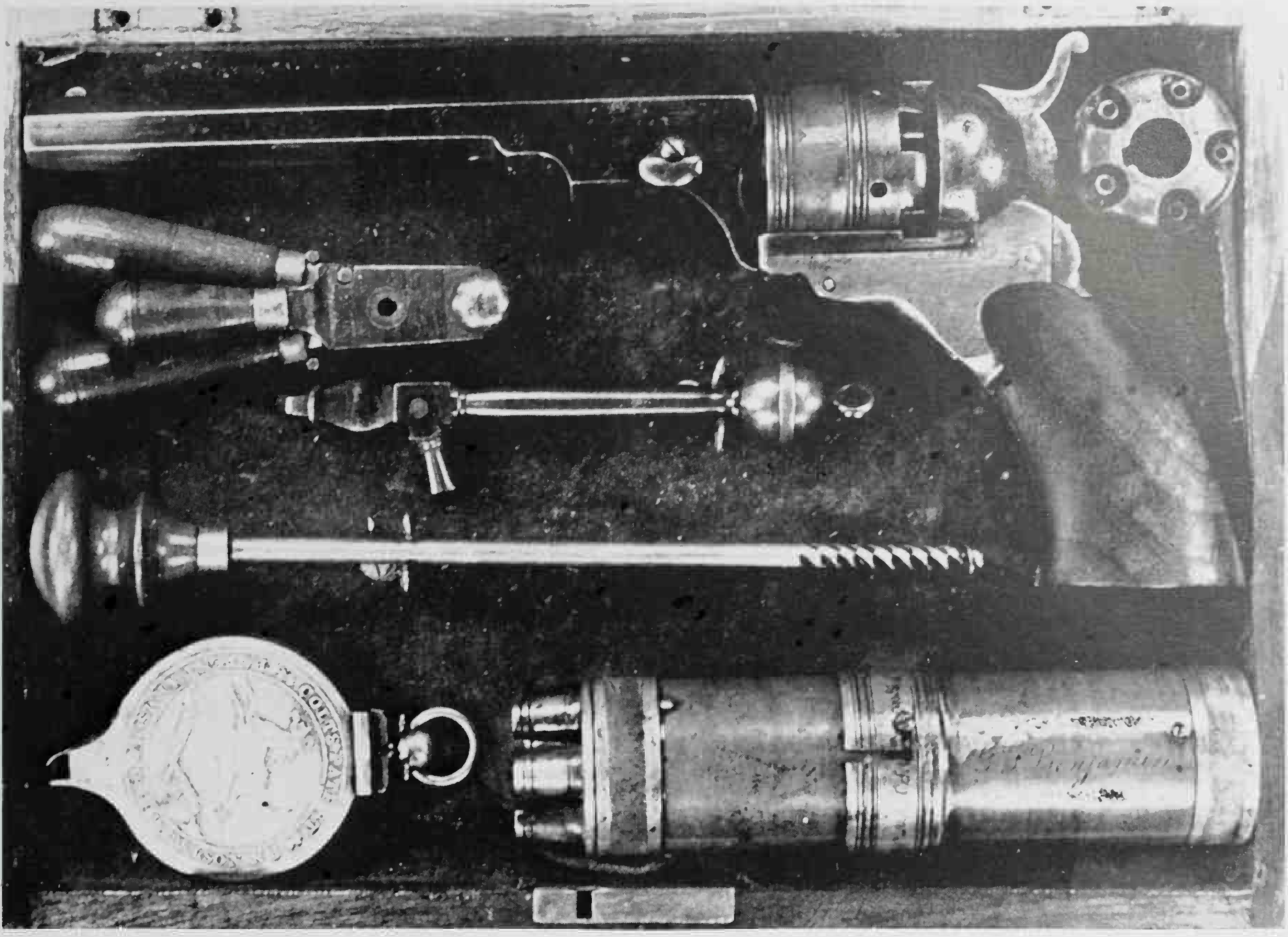
Above: **An engraving of the Second Seminole War of 1835,in which Chief Micanopy *(at left)* helped lead the Indians. *At right:* A Paterson Colt cased with accessories. *Below right:* A Paterson Colt and the 1837 Military Pistol. *Bottom right:* The 1837 Paterson Revolving Carbine.**

imprinted in the cylinders. The gun sights were incorporated into the hammer such that when the pistol was cocked and ready for firing, the notch appeared in conjunction with the barrel sight in order to provide aiming capability. A powder flask and magazine-capping device for holding percussion caps were usually included with the boxed pistol, along with a bullet mold, a cleaning rod, and various ingeniously designed tools for disassembling the pistol. Sometimes an extra cylinder was included, thus providing the owner with a total of 10 shots without reloading.

The greatest markets that Colt had for the output of his Paterson Factory were both the South and the Republic of Texas, which at this time was engaged in its war of independence with Mexico. So many of Colt's pistols from the Paterson factory were sold to the Texans that Colt later referred to the regular Paterson model as the 'Texas Arm.'

Even at this early stage, Samuel Colt knew the value of beauty in workmanship and the need for showmanship in the sale of firearms. The Paterson factory was capable of producing special arms, made to order—with differing numbers of shots in the cylinders being available, as well as different kinds of ornamentation. The extravagance of this ornamentation was limited only by the customer's ability to pay for it. It included ornate engravings, inlays and ivory or pearl stocks and handles.

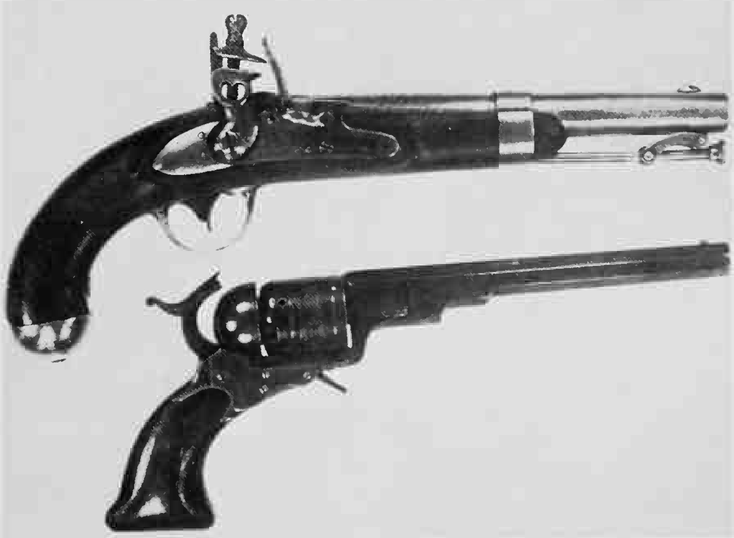
Of course the biggest potential market for firearms was the United States government, and Colt tried in 1837 to get his arms adopted by the government. But government

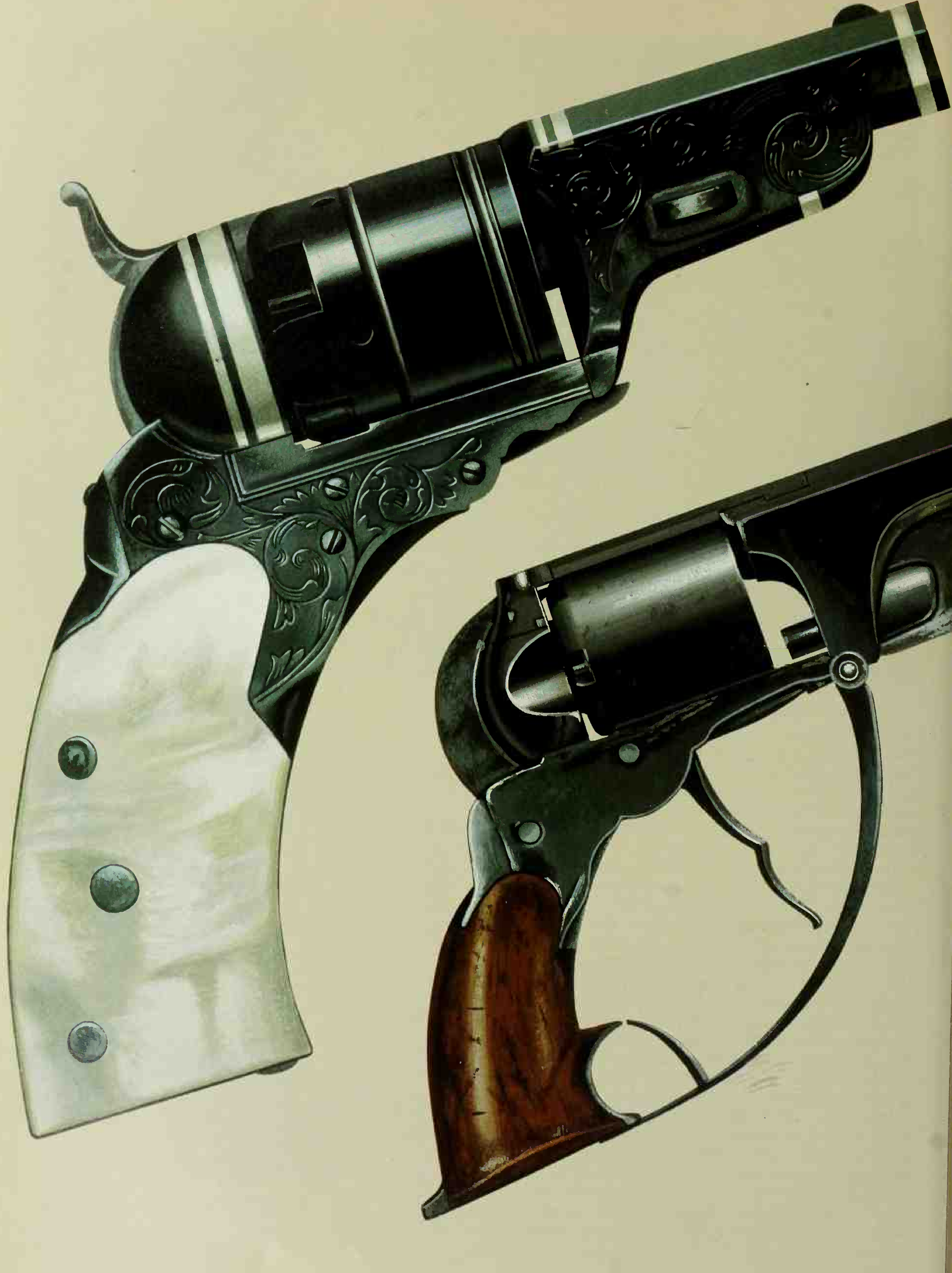


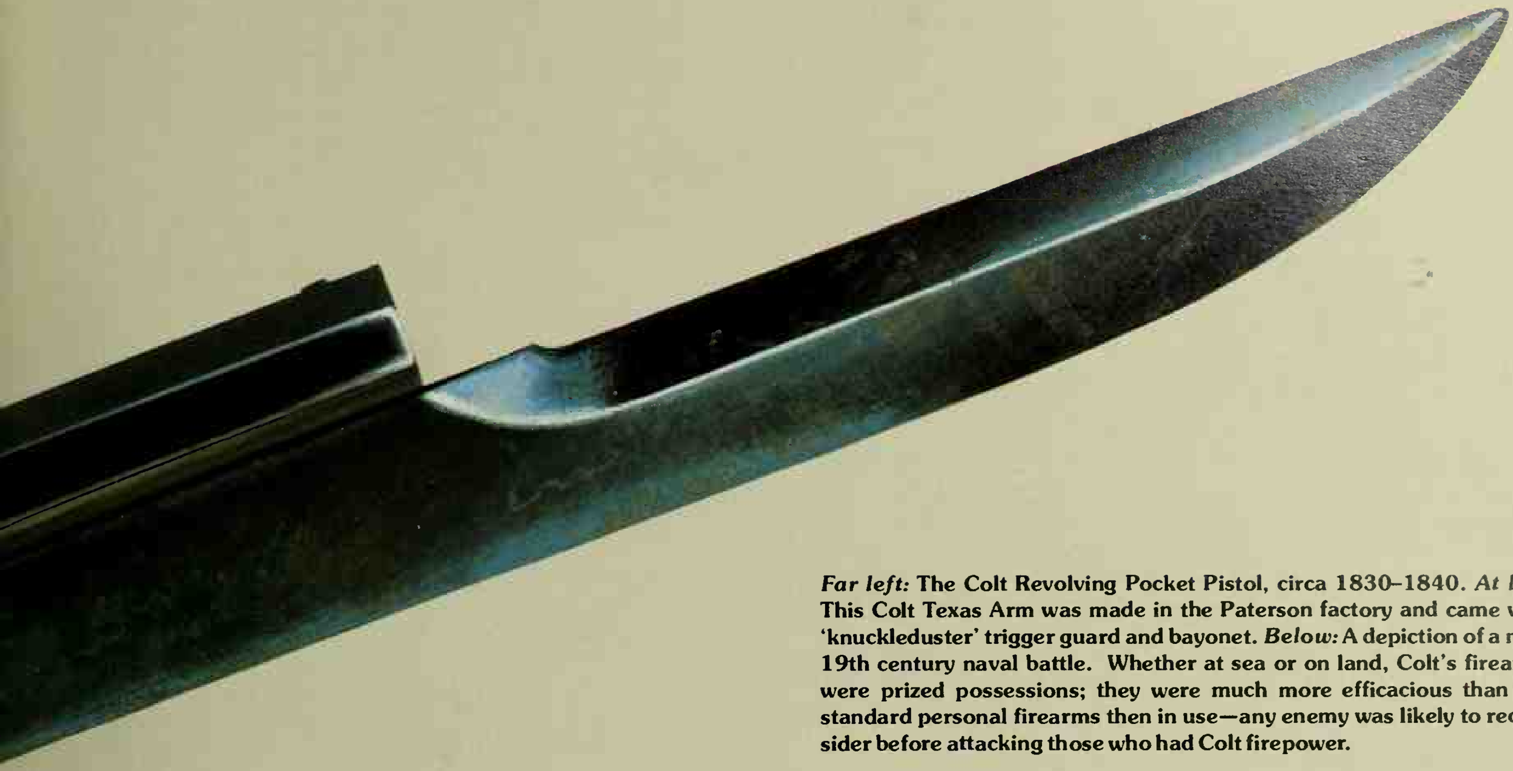
bureaucracy was no less then than what it is today, and Colt was turned down. The Ordnance Board felt that Colt's firearms were too complicated and that therefore they could break down too easily. This, combined with the idea that the flintlock single shot muskets and pistols which were then employed by the army were good enough, led the board to conclude that the status quo was what the government wanted.

But the bureaucrats in Washington were not the men who would actually be using his weapons. So Colt undertook to place his pistols in the hands of soldiers—who he felt would see at once the advantages of being able to deliver several shots without reloading.

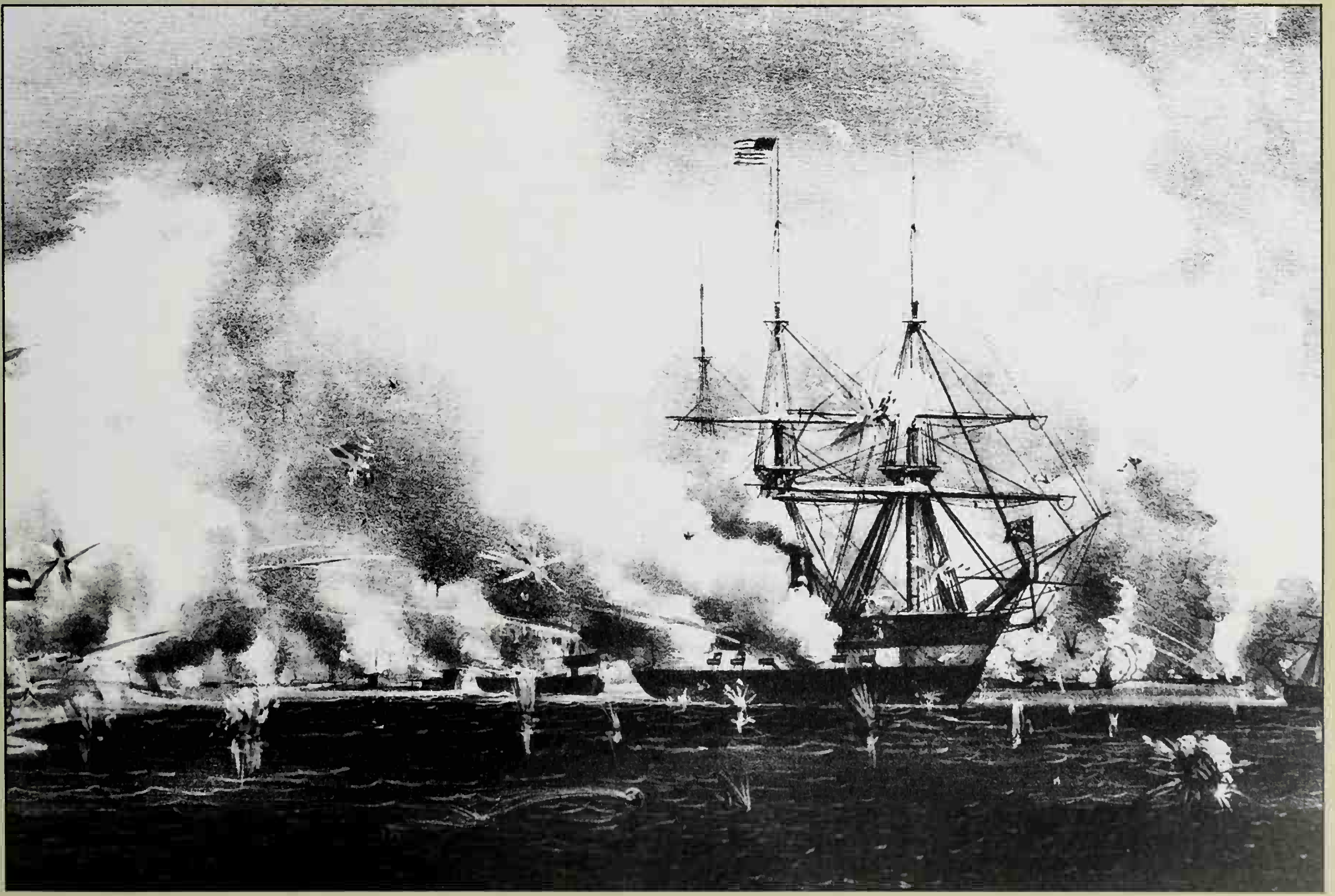
Taking a number of his pistols with him, he journeyed to the seat of the Seminole War in Florida, which was the only war going at the time. Here he sold his arms directly to the officers and the troops who were engaged on a day-to-day basis in warfare with the Indians. Naturally, the soldiers in the field found these weapons to be of tremendous advantage over the arms they were accustomed to using. The clamor went up for the government to procure more of Colt's arms. One army captain flatly testified that Colt's firearms were eight times more efficient as arms then in use. Another officer testified that 'if our enemies knew that we were in possession of such arms, they would be less apt to commence hostilities with us.' It was generally felt by those who had used Colt's pistols that one man armed with one Colt pistol was fully equal to five or six men armed with common muskets.

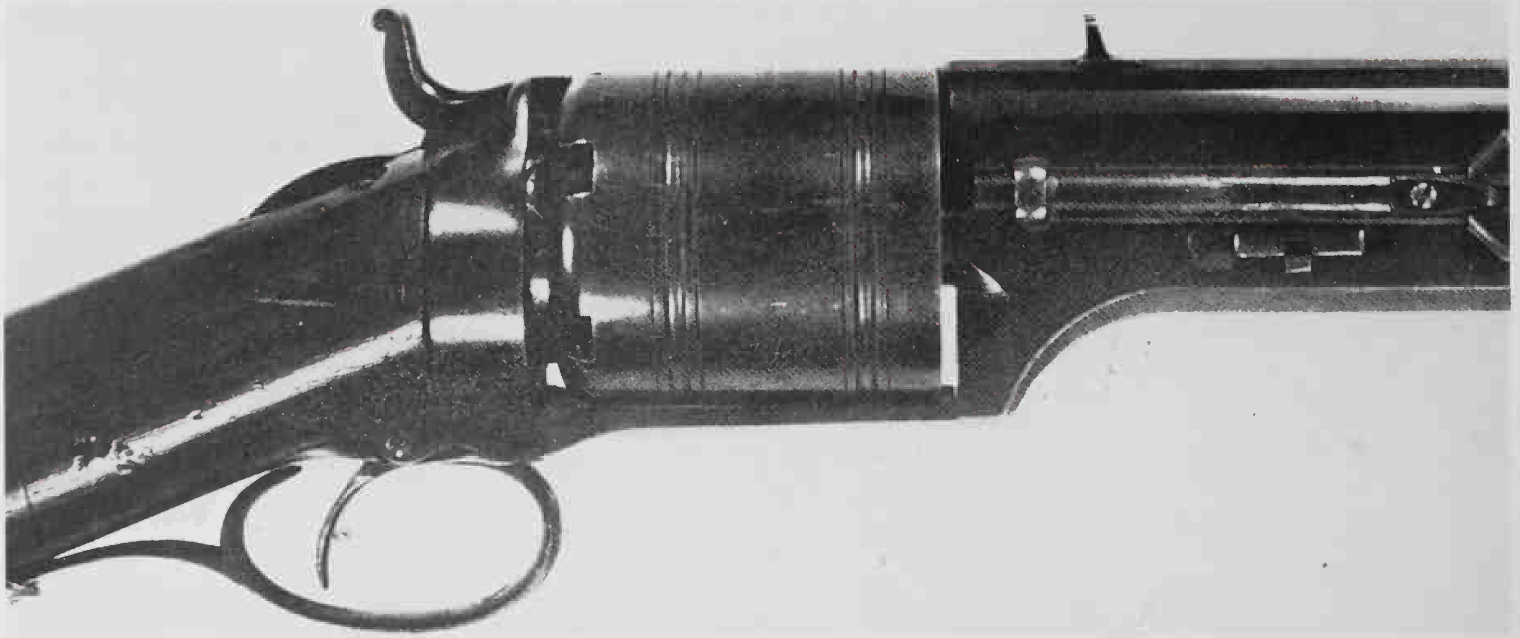






Far left: The Colt Revolving Pocket Pistol, circa 1830–1840. *At left:* This Colt Texas Arm was made in the Paterson factory and came with 'knuckleduster' trigger guard and bayonet. *Below:* A depiction of a mid-19th century naval battle. Whether at sea or on land, Colt's firearms were prized possessions; they were much more efficacious than the standard personal firearms then in use—any enemy was likely to reconsider before attacking those who had Colt firepower.





Above: **A hammer model of the 1839 Paterson Revolving Rifle (see overleaf caption, page nine).** ***At right:*** **An announcement of a demonstration of Colt Paterson arms.** ***Opposite:*** **This engraving depicts an 1858 parade, celebrating the laying of the Atlantic Cable, which was presaged by Sam Colt's submarine telegraph cable in New York harbor.**

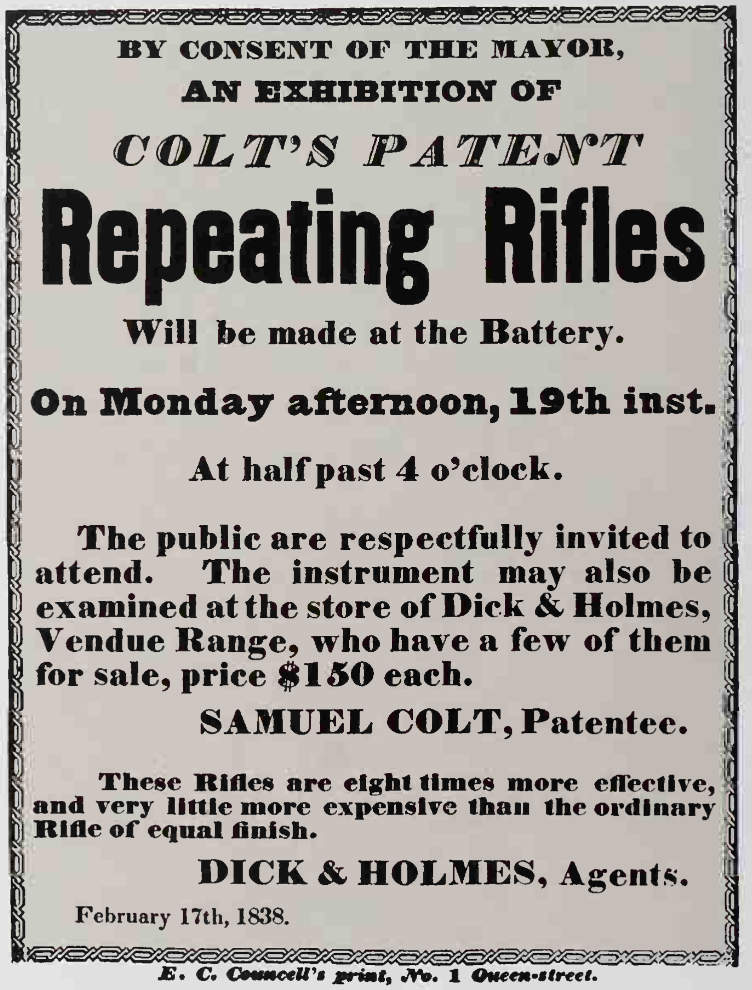
Unfortunately, while Colt was in Florida selling pistols to men whose lives depended on them, back home his subordinates at the Patent Arms Company were quarreling about management. There are even accounts of some of these employees dueling to the death over their disagreements. Technically, Colt was an employee of the factory, yet it was his ideas and his genius that kept things moving: when he was not personally present, things simply fell apart.

The Paterson Factory came to an end mostly because the guns were sufficiently complicated by design that they had to be made by hand, and that multi-firing arms were not needed by the average man. Time and distance had defeated this first of Colt's factories. It was simply not possible to get enough Colt weapons into the hands of those who needed them and would appreciate them to make the factory profitable. As as result, the 'Patent Arms Manufacturing Company of Paterson, New Jersey, Colt's Patent' closed permanently in 1842.

With the Paterson Factory in bankruptcy, Colt reverted back to (what were for him) his childhood toys—namely, 'torpedoes.' These torpedoes were actually what we would refer to today as mines. Submerged cable, another of his inventions, was used to electrically explode the mine from miles away. In 1842, Congress granted $15,000 for the project, ostensibly to protect US harbors in times of war. Two years later, Congress made a special adjournment to see Colt destroy a ship of over 500 tons, which at that time was under sail and travelling at five knots.

Things submerged intrigued Colt. In the mid-1840s he laid the first underwater telegraph cable in New York harbor.

The year 1845 was pivotal for Colt. Texas had won its independence from Mexico by this time, and had been accepted as a state into the Union. But trouble with Mexico persisted over certain territorial claims in and around the Rio Grande River. General (later President) Zachary Taylor, who had taken part in the Seminole War in Florida, and who may well have been acquainted with Colt's pistols, was sent to southeastern Texas.



BY CONSENT OF THE MAYOR,

AN EXHIBITION OF

COLT'S PATENT

Repeating Rifles

Will be made at the Battery.

On Monday afternoon, 19th inst.

At half past 4 o'clock.

The public are respectfully invited to attend. The instrument may also be examined at the store of Dick & Holmes, Vendue Range, who have a few of them for sale, price $150 each.

SAMUEL COLT, Patentee.

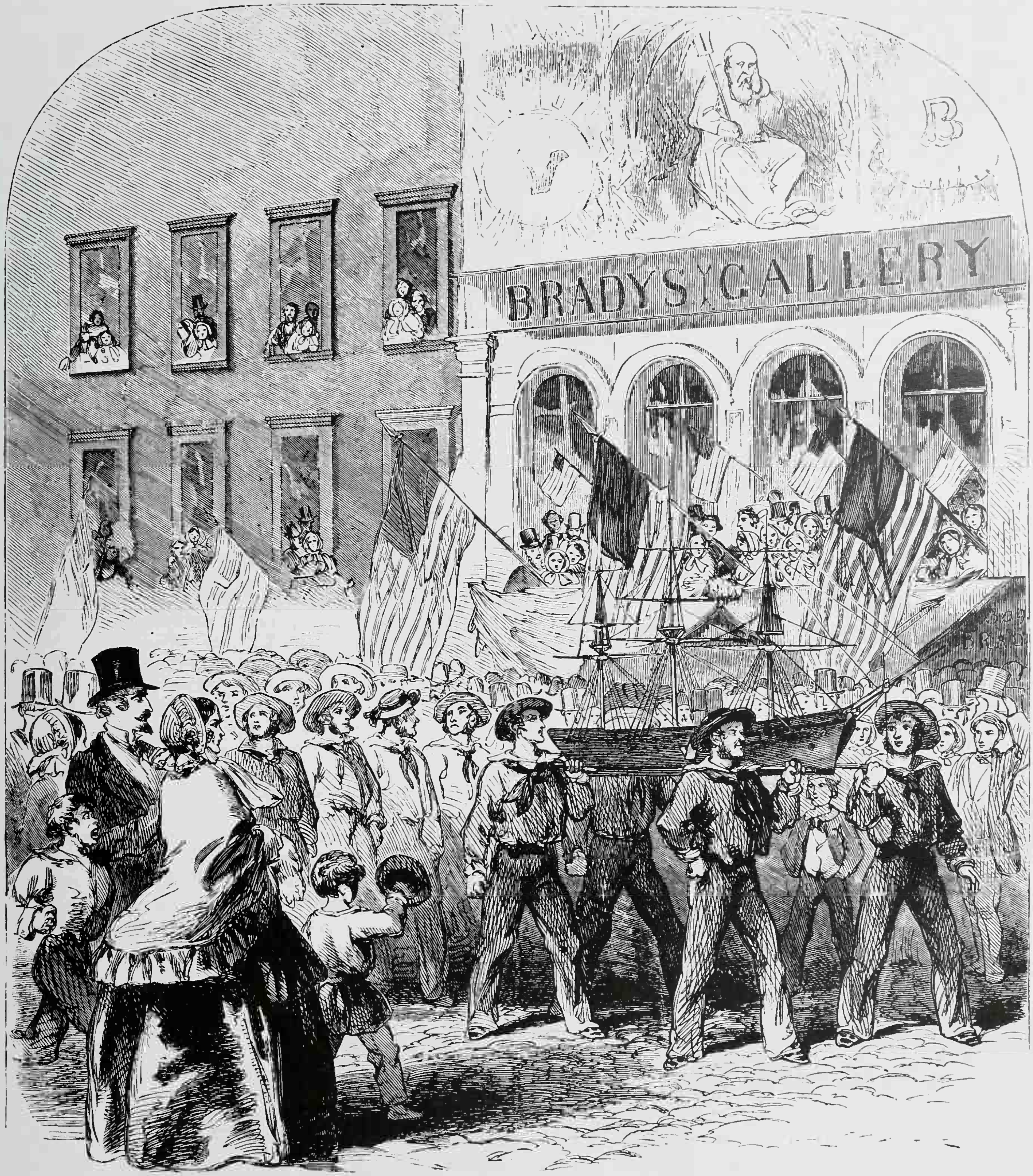
These Rifles are eight times more effective, and very little more expensive than the ordinary Rifle of equal finish.

DICK & HOLMES, Agents.

February 17th, 1838.

E. C. Councell's print, No. 1 Queen-street.

As the prospect for hostilities increased, so did the clamor for Colt's repeaters. All the available Colts were purchased by the government and sent to Texas. Now the guns were available to those men who needed them the most. One of those men was Samuel H Walker. Like Taylor, Walker had fought in the Florida wars and had come into contact with Colt's pistols. Walker was a Texas Ranger who, with 14 other men, had at one time engaged 80 Comanche warriors and lived to tell the tale. Their Colt 'five shooters' had allowed them to kill 33 of the marauding Indians.

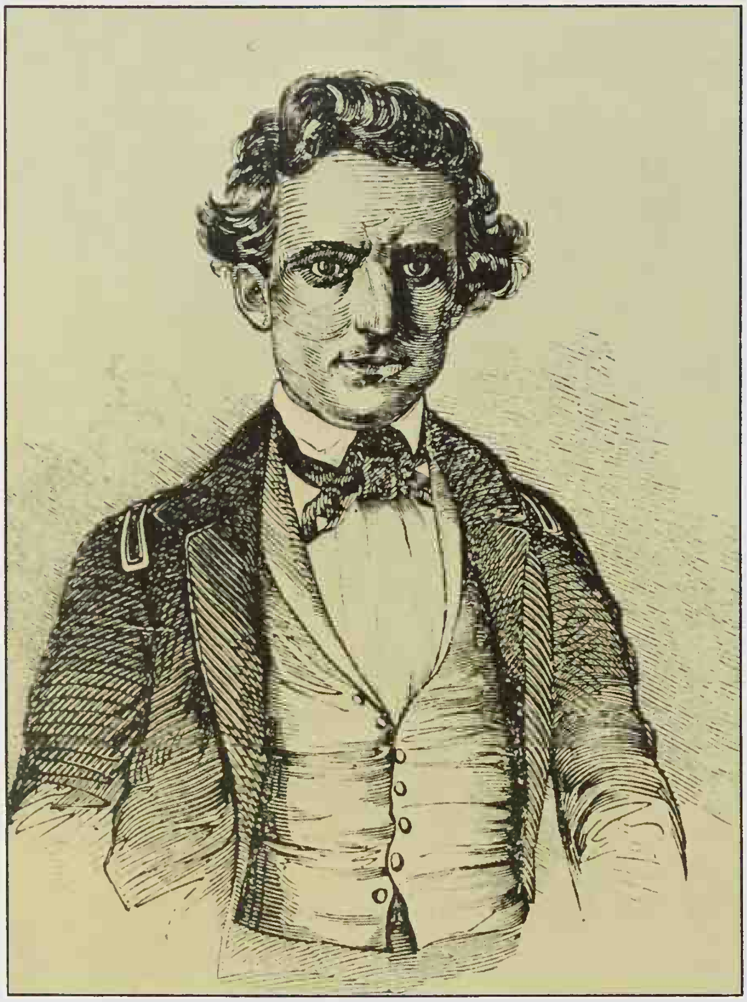


The supply of available Colts was meager to begin with, and battlefield losses lessened the stockpiles even further. So Walker took leave of the Army in 1846, at Zachary Taylor's order, and came North to both drum up volunteers for the Mexican campaign—and more importantly, to procure more Colt weapons.

Walker got in touch with Colt. The main question was what could be done about getting back into production. Colt possessed his patents only. He had neither money nor a factory. But the world had finally realized the value of his repeaters, and that realization generated a demand that, to this day, survives.

Even though Colt's patents had reverted to him upon the demise of the Paterson Factory, the models he used to produce the guns were lost. But determination was a trait not lacking in Samuel Colt.

He redesigned one of his earlier pistols from memory, even making certain improvements as he went along. These

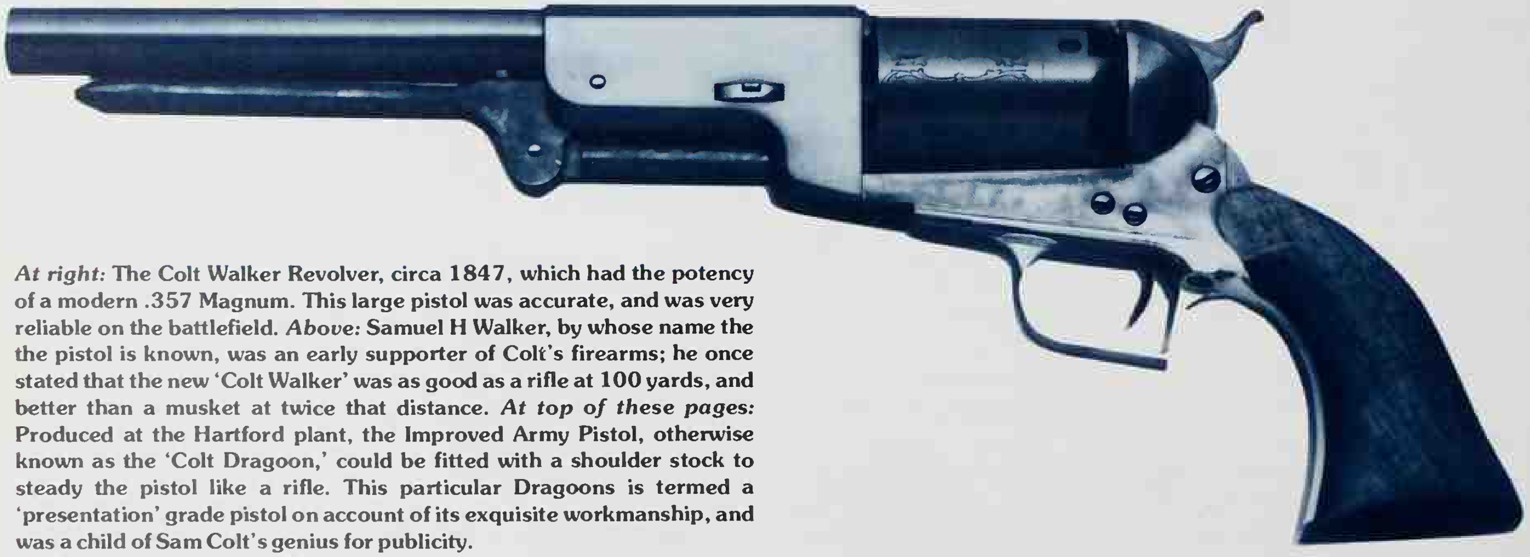


improvements mainly incorporated fewer moving parts, thus simplifying the process of manufacture and meeting head-on the government's original objections to the pistols as being too unreliable in a battlefield setting.

Walker wanted 1000 pistols as soon as possible. Colt contacted Eli Whitney, son of the inventor of the cotton gin. Whitney was at that time manufacturing arms for the US government in Whitneyville, Connecticut, and agreed to produce the guns, which were to be six, rather than five shot, repeaters and have nine inch barrels. The precision with which Colt's guns had to be made necessitated that Whitney purchase or fabricate special machinery to produce the parts. The total price per pistol was to be $28.00 (this included the accessories).

After the customary barrage of governmental red tape and delays, Colt's pistols began arriving in Mexico. Colt later claimed that because of the contract arrangements with Whitney, he actually made no money on these pistols. When the contract with Whitney expired, however, Colt did wind up owning all of that specialized machinery that the Whitneyville plant used to produce the weapons. And this collection of specialized lathes, dyes, moldings and the like would later provide Colt with the foundation for his Hartford, Connecticut plant.

Colt sent a matched pair of pistols to Walker as a personal present. But shortly afterwards, Walker was killed in action in October 1847. After Walker's death, one of these pistols was sent back to Colt, who regarded it as one of his most



At right: **The Colt Walker Revolver, circa 1847, which had the potency of a modern .357 Magnum. This large pistol was accurate, and was very reliable on the battlefield.** ***Above:*** **Samuel H Walker, by whose name the the pistol is known, was an early supporter of Colt's firearms; he once stated that the new 'Colt Walker' was as good as a rifle at 100 yards, and better than a musket at twice that distance.** ***At top of these pages:*** **Produced at the Hartford plant, the Improved Army Pistol, otherwise known as the 'Colt Dragoon,' could be fitted with a shoulder stock to steady the pistol like a rifle. This particular Dragoons is termed a 'presentation' grade pistol on account of its exquisite workmanship, and was a child of Sam Colt's genius for publicity.**

GEORGE WASHINGTON
COLTS PATENT
Colts
Bicentenial
N.S.G.A.
Show Model
Special Serial No.
1776 - 1976

cherished possessions. There was obviously a deep bond of friendship between these two men—the one an inventor of genius caliber, and the other a commander of soldiers in the field—both engaged in the defense of their country and the expansion of its frontiers.

The 1000 Whitney/Walker Colts that had finally arrived in Mexico did not see much action, however. A peace treaty was signed in February of 1848, ending the Mexican war. But Colt was again in the gun business, this time to stay.

It is interesting to consider the overall specifications of these 'Model of 1847' army pistols. They were six shooters of .44 caliber, with a nine inch barrel, and proved to very accurate indeed. Walker stated them to be as good as a rifle at 100 yards, and better than a musket at twice that distance. They weighed four pounds, nine ounces, and displayed the now famous squareback triggerguards made of brass. In firepower, they were about equal to today's .357 Magnums. Quite an achievement for the 1840s! In addition, honoring the man who inspired, in a sense, the design of these pistols, this model is commonly known as the 'Colt Walker.'

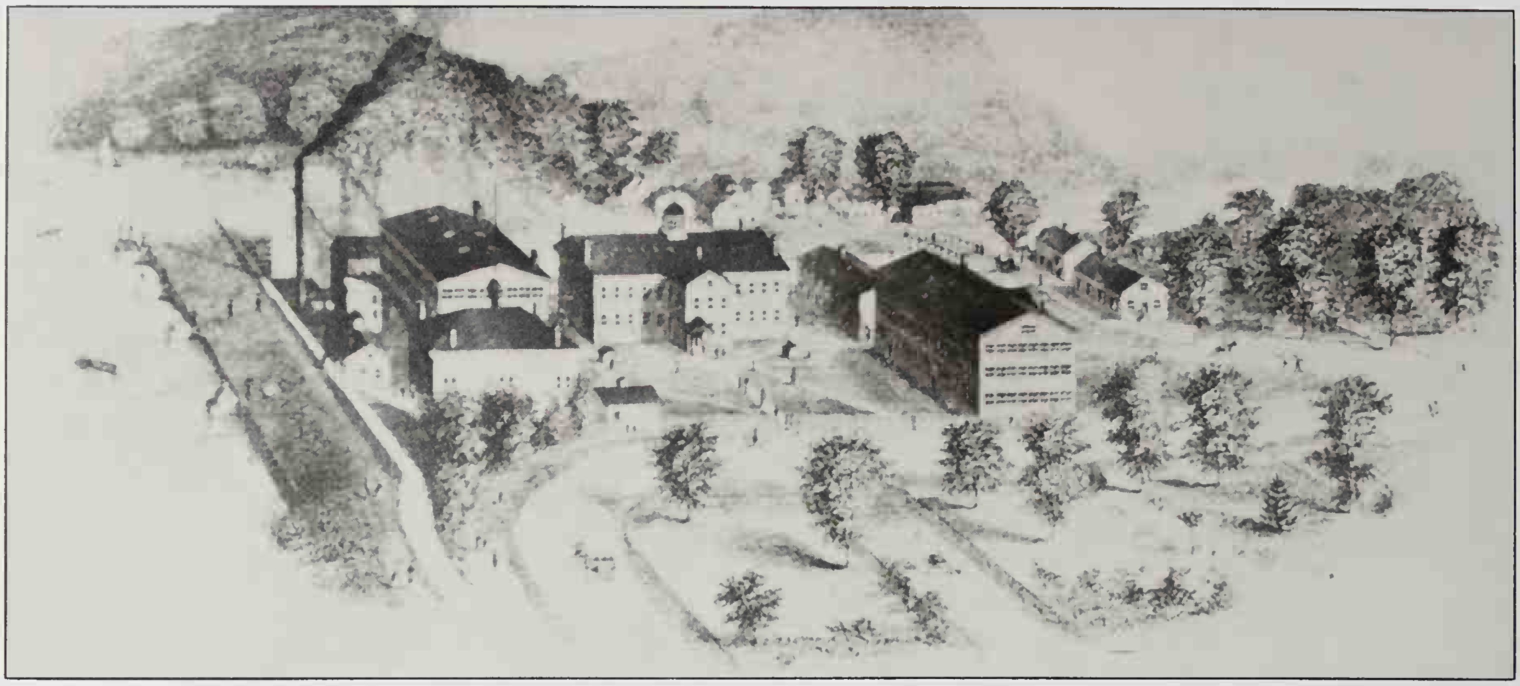
Samuel Colt was by nature a showman. He turned this flair for catching the public mind to his advantage by starting the practice of making 'presentation' grade, usually boxed, sets of pistols to give as gifts to powerful and influential people. These specimens were often masterpieces of the gunmaker's art. They were virtually flawless in appearance. Deep bluing was set off by heavy inlays of polished gold flowing over the barrel and other parts in delicate traceries. The grips were often richly carved with ivory insets. Who would not have been (or would not be today) stunned by such a noble gift?

It was at his factory on Pearl Street in Hartford that the large scale production of Colt pistols began. Between the years 1845 and 1852, an average of 1000 firearms per year were produced by the Hartford Factory, including carbines as well as repeating pistols. Times were changing, and the need for firearms was growing. The Gold Rush to California was under way. Pioneers were pushing westward. A general feeling of lawlessness had engulfed the nation, and the need for personal protection had grown. Colt was very aware of these circumstances, and quickly added pocket pistols and belt models to his line of firearms.

One of the most interesting pistols to be produced at the Hartford Factory was the Improved Army Pistol, which is called by collectors the 'Colt Dragoon.' These Dragoons were six shooters of .44 caliber, and were made in both 7.5 and eight inch barrel lengths. The Colt Dragoon was the mainstay of the pistol line until it was superseded by the New Model Army Pistol in 1860.

It is interesting to note that the Dragoons, when sold to both the army and civilians, could be equipped with shoulder stocks that could, in effect, turn the pistol into a rifle. This was feasible because of the overwhelming advantage of accuracy that the Colt weapons possessed in relationship to other weapons of the day. From 1847 until 1860, the total production of Colt Dragoons was about 22,000, and apparently half of these went to civilians.

As the popularity of his guns increased, so did the probability of patent infringements upon Colt's designs. Colt took to imprinting upon each of his firearms 'Colt's Patent,'



Above: The Whitneyville Armory, where the Whitneyville Colts were made in 1847. *At right:* Part of the original Hartford, Connecticut plant. From this small beginning, the plant expanded on a grand scale *(below right)*: at this stage, the factory was shaped like the letter 'H,' and its entrance was capped by a blue dome covered with gold stars.

and in his advertising the words 'Beware of counterfeits and patent infringements' appeared regularly.

Even though the original Dragoons were of the cap and ball variety, they proved to be extremely popular even after the invention of the center fire cartridge. And in the middle 1970s, 100 years later, Colt Arms bowed to this continuing demand by producing the 'Third Model Dragoon.'

In 1848, Colt so perfected the designs of his weapons, and particularly the Dragoons, that the parts of all of the arms of the same model could be interchanged with parts from other Colts. Again, this was due to the standardization of measurements and the perfecting of the precision of the machinery on which the arms were produced. The simplification of manufacture produced only five moving parts in the Dragoons, as opposed to 17 such parts in earlier models.

There are three basic classifications of Dragoon pistols which are used by collectors today. The Number One Dragoon is the first model that was made at Hartford, and incorporated a round cylinder, square back trigger guard and no roller on the hammer.

The Number Two Dragoon was an improved model that was made after 1849. It featured a round back trigger guard, rectangular cylinder notches, a roller on the hammer and pins between the nipples. The Number Three Dragoon is virtually the same as the Number Two, except that it is fitted with a shoulder stock.

Colt's master patent was granted him by the United States government in 1836 and was due to expire by 1849. But the legal reasoning behind the granting of patents was that a patent was to be issued so that the inventor could have a sufficient amount of time in which to tool up and produce his invention free of competition and, thereby, realize a profit on his idea. Colt, however, was able to prove that he had *not* received a reasonable profit in the 14 years since the patent was issued, and an extension was granted him until 1857.

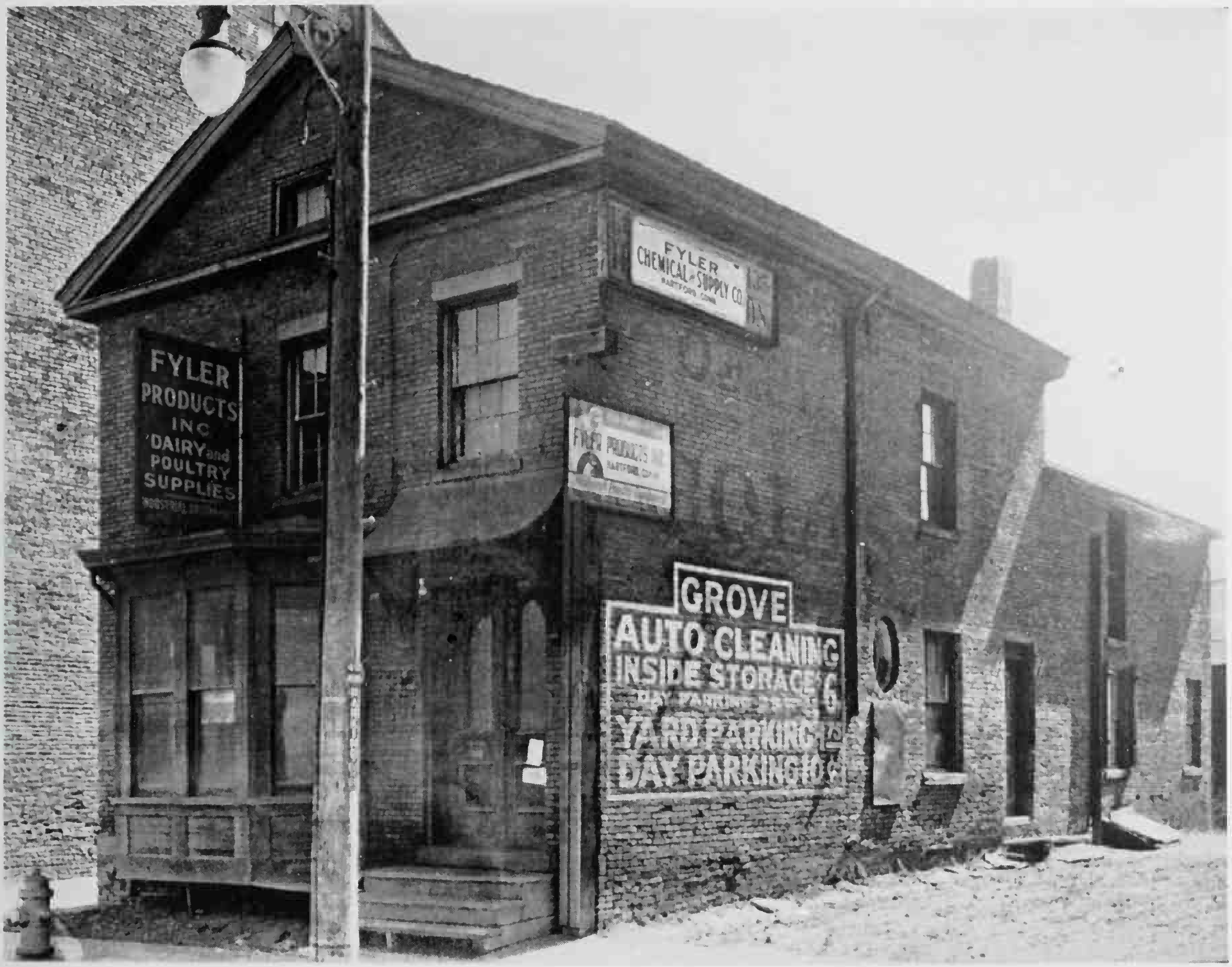
By the early 1850s, Samuel Colt was a prosperous and influential figure. He was given a commission as a lieutenant colonel in the Connecticut State Militia. Thereafter he referred to himself, rightfully, as Colonel Colt. It is interesting to note, however, that in 1861 the Colonel's official military commission was withdrawn. This was due to the fact that he was far more valuable to his country as an arms inventor and producer than he was as a field commander.

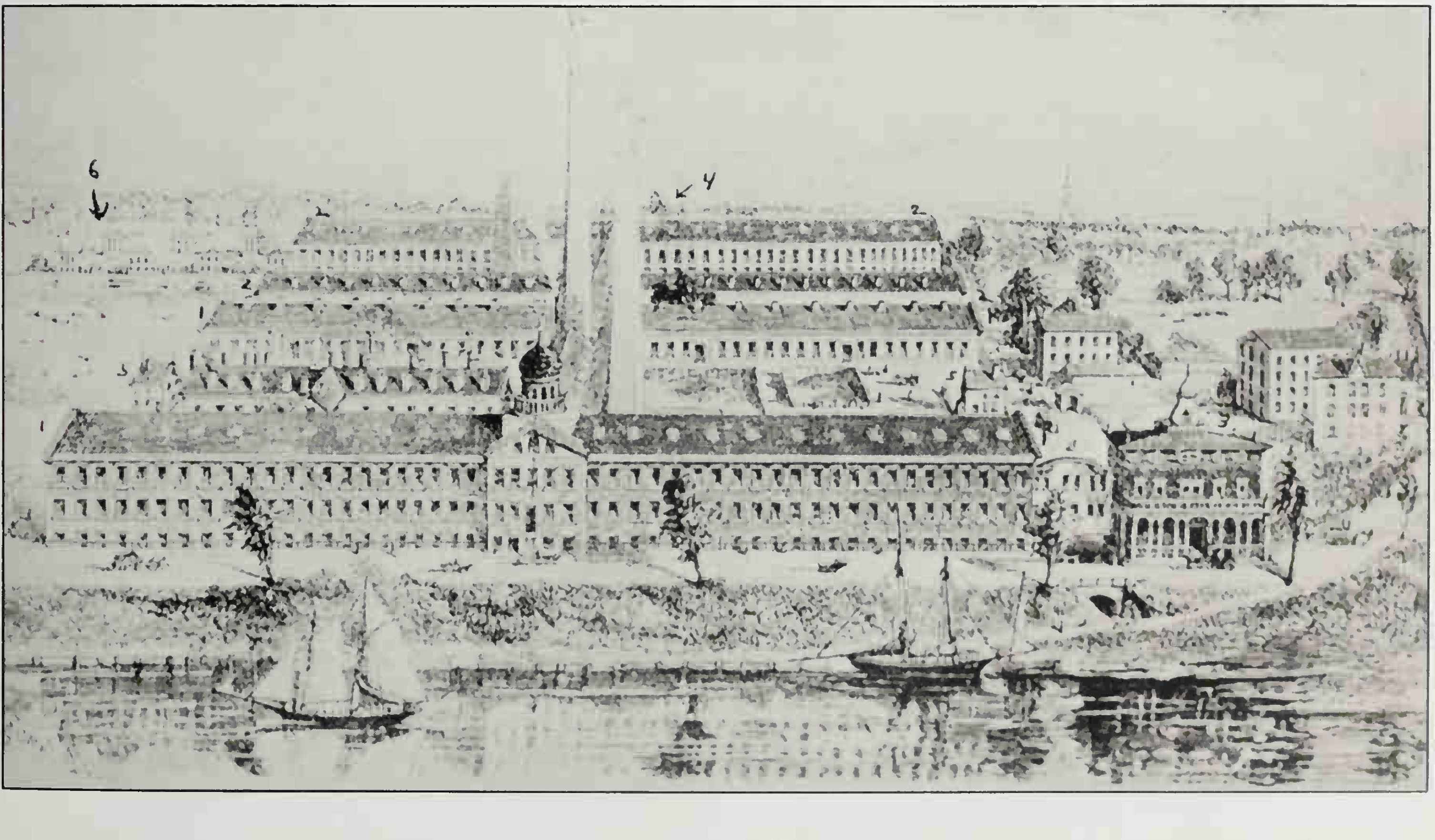
In June of 1856, Samuel Colt married Elizabeth Hart Jarvis. Her brother was vice-president of the Colt Armory at that time. The couple honeymooned in Europe for six months and even attended the coronation of Tsar Alexander II in St Petersburg, Russia. In 1858, Colt sent three sets of firearms engraved and inscribed to the new Tsar. These guns are, by far, the most intricate of the presentation models and presently reside at the Hermitage Museum in Leningrad in the Soviet Union.

The Hartford Plant grew on a grand scale. The main factory building itself was of brick construction and shaped like the letter 'H.' It was three and one half stories high and each parallel section of the 'H' was 500 feet long. The building itself was capped by a large blue dome containing gold stars similar to a Russian Orthodox cathedral.

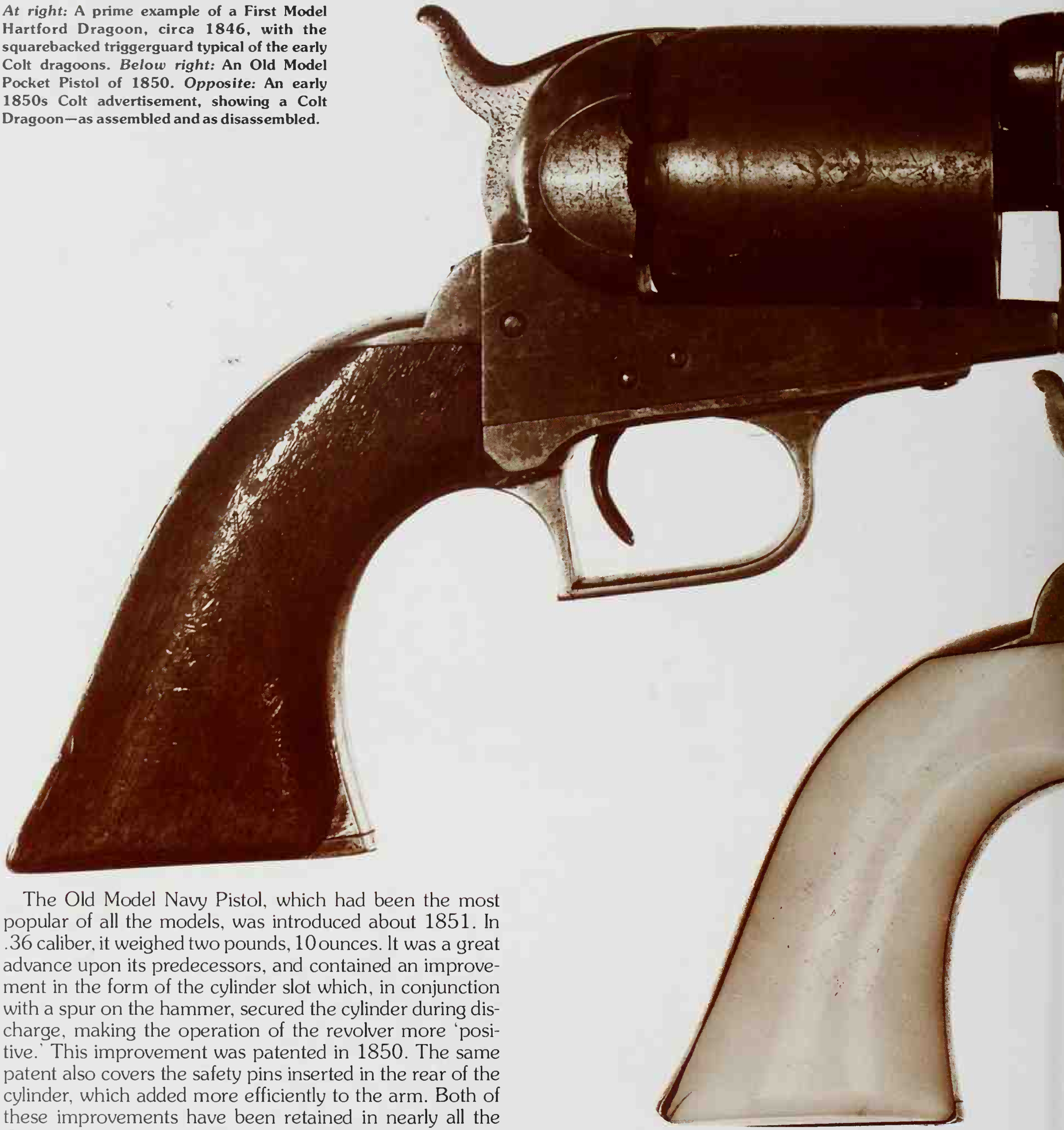
The Hartford Factory developed into a school of great influence for inventors, technicians and mechanics of the day. Colt's magnetic personality drew many of the best minds in the United States to him. Rollin White at one time worked for Colt and himself patented certain devices which later became the basis for the Smith and Wesson Firearms Company. Francis A Pratt and Amos Whitney were associated with Colt during this period and their partnership later formed the Pratt and Whitney Company, which today manufactures engines of almost every kind.

In 1850, two models of pistols were introduced by Colt. The Model 1849 Pocket Pistol and the Model 1851 Navy Pistol came to the marketplace. Since there is a series of belt and pocket pistols associated with this period of time, it is well to quote from Colt's *Armsmear* publication to differentiate the models involved. 'Pocket Revolvers' with six inch, five inch, four inch and three inch barrels and .31 bore, were introduced about 1848. They were first made without lever rammers and were loaded by removing the cylinder from its pin and using the pin for a rammer.


FYLER
PRODUCTS
INC
DAIRY and
POULTRY
SUPPLIES
FYLER
CHEMICAL & SUPPLY CO.
HARTFORD, CONN.
FYLER PRODUCTS INC
HARTFORD, CONN.
GROVE
AUTO CLEANING
INSIDE STORAGE
YARD PARKING
DAY PARKING


6
4
2
2
2
1
5
5
1
3

At right: A prime example of a First Model Hartford Dragoon, circa 1846, with the squarebacked triggerguard typical of the early Colt dragoons. Below right: An Old Model Pocket Pistol of 1850. Opposite: An early 1850s Colt advertisement, showing a Colt Dragoon—as assembled and as disassembled.



The Old Model Navy Pistol, which had been the most popular of all the models, was introduced about 1851. In .36 caliber, it weighed two pounds, 10 ounces. It was a great advance upon its predecessors, and contained an improvement in the form of the cylinder slot which, in conjunction with a spur on the hammer, secured the cylinder during discharge, making the operation of the revolver more 'positive.' This improvement was patented in 1850. The same patent also covers the safety pins inserted in the rear of the cylinder, which added more efficiently to the arm. Both of these improvements have been retained in nearly all the Colt revolvers made since.

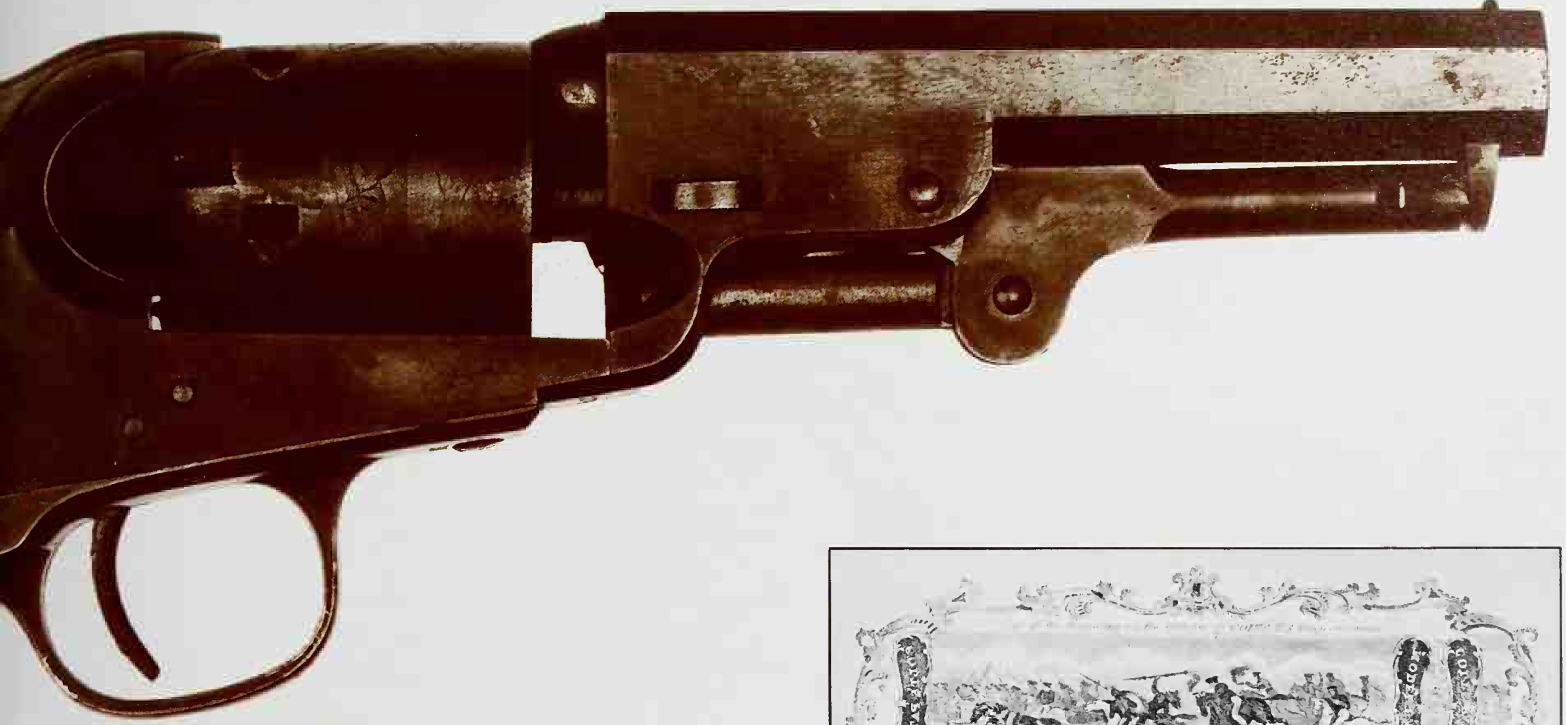
The Old Model Pocket Pistol was improved in 1849 by the introduction of the improved features of the Navy Pistols and has not been materially altered since. It was .31 caliber, and its weight was from 24 to 27 ounces, dependent upon the length of its barrel.

The New Pocket and New Model Police, New Model Army and New Model Navy, were all introduced after 1860. They presented nothing new in principle, but by a better arrangement of parts—and in the Army Model, by less weight—suited the markets better, and were mostly made in .36 caliber, except for the New Model Army in .44 caliber.

The New Pocket Pistol weighed from 25 to 28 ounces, the New Model Police Pistol weighed from 24 1/2 to 26 ounces, the New Model Navy Pistol weighed two pounds 10 ounces, and the New Model Army Pistol weighed two pounds 11 ounces.

Also, during this period, the Sidehammer series of guns was introduced. The thing that made the Sidehammer series unique was that for the first time, a solid frame was employed. This means that the barrel was screwed into the frame, thus making the barrel and frame integral.

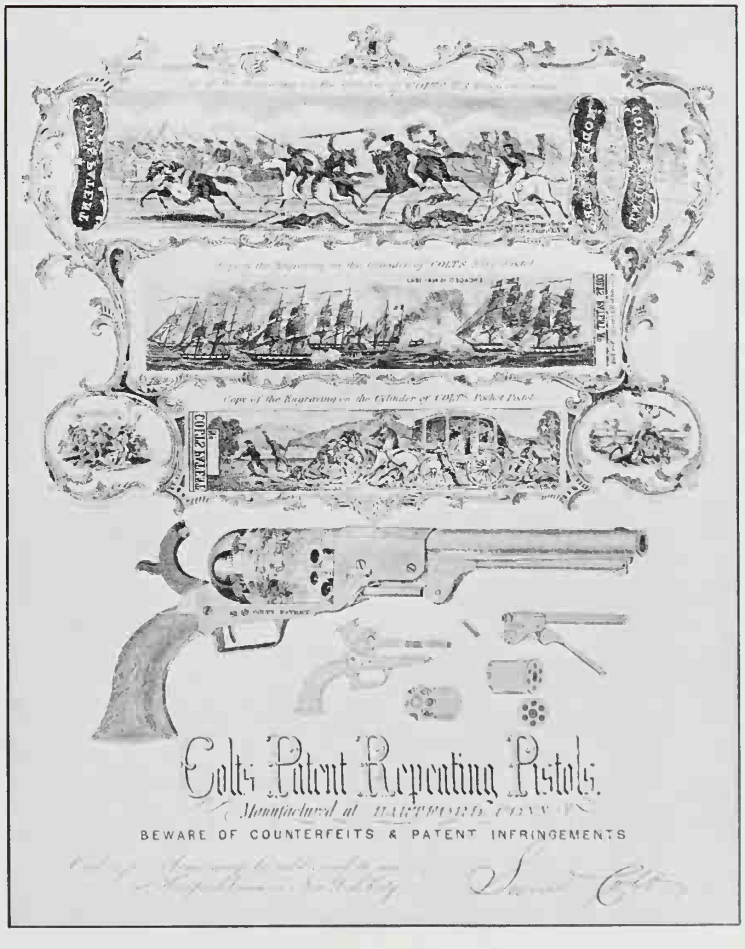
It is interesting to note that even on common production



models, the scene that appeared on the cylinders was usually of a fight between pistol-armed men and Indians. Later, these cylinder scenes would change. On the cylinders of the Navy Colts, the scene was generally one of both steam and sailing ships battling one another. The overall motif for these naval battle scenes was taken from an episode in the Texas War of Independence in which Commodore Moore of the Texas Navy defeated a fleet of Mexican vessels which was greatly superior to his own fleet: this actual historical event was used to demonstrate the fact that a man armed with a Colt could defeat a force vastly outnumbering him.

The 1851 Navy Colt was very popular as a belt revolver, because it was lighter than the Dragoon. The Navy Pistol, which was actually used by the Army (and comparatively little by the US Navy), wound up being a favorite dueling weapon among various adversaries in the California Gold Rush period.

In 1849, Colt hired a Mr EK Root as his factory foreman and general superintendent. Root was a mechanical engineer and inventor in his own right. But his talents did not come cheaply. Colt exhibited a fair amount of farsighted wisdom by hiring Mr Root at the price demanded. Colt felt—and was later justified in believing—that it was cheaper, in



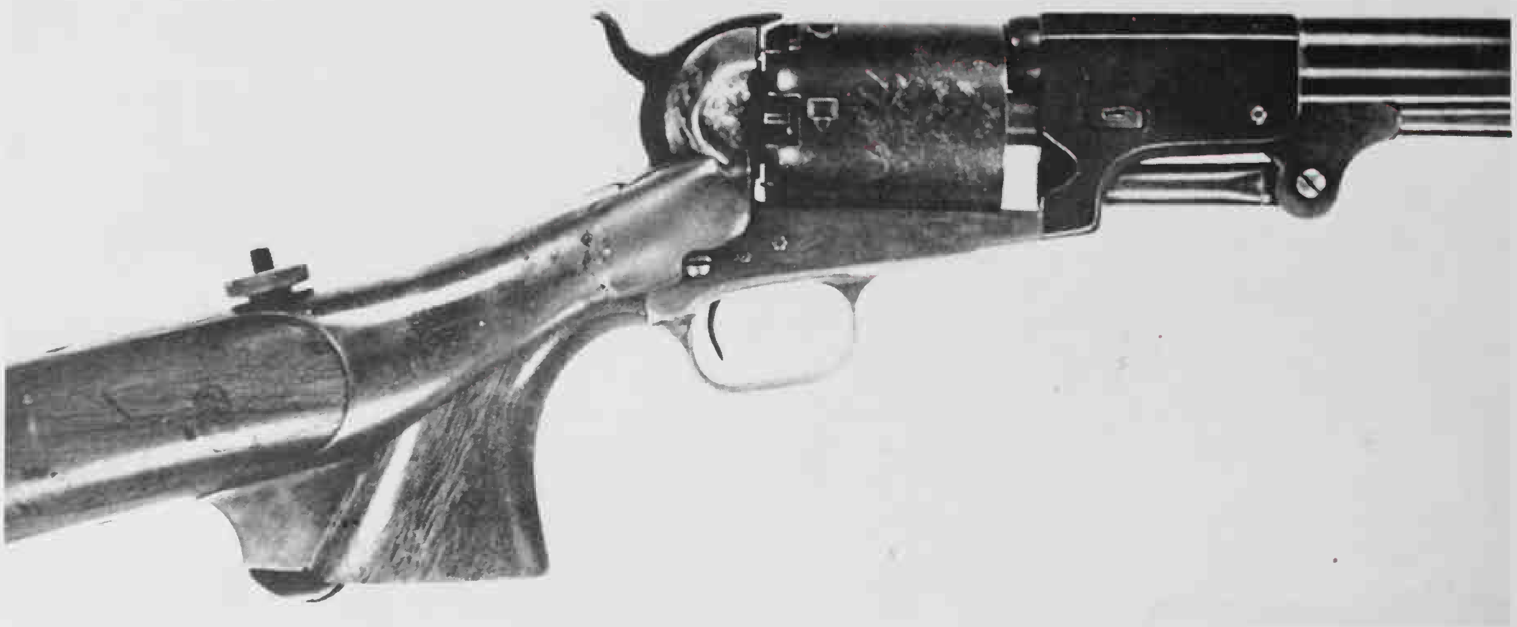
Copy of the Engraving on the Cylinder of COLTS Navy Pistol

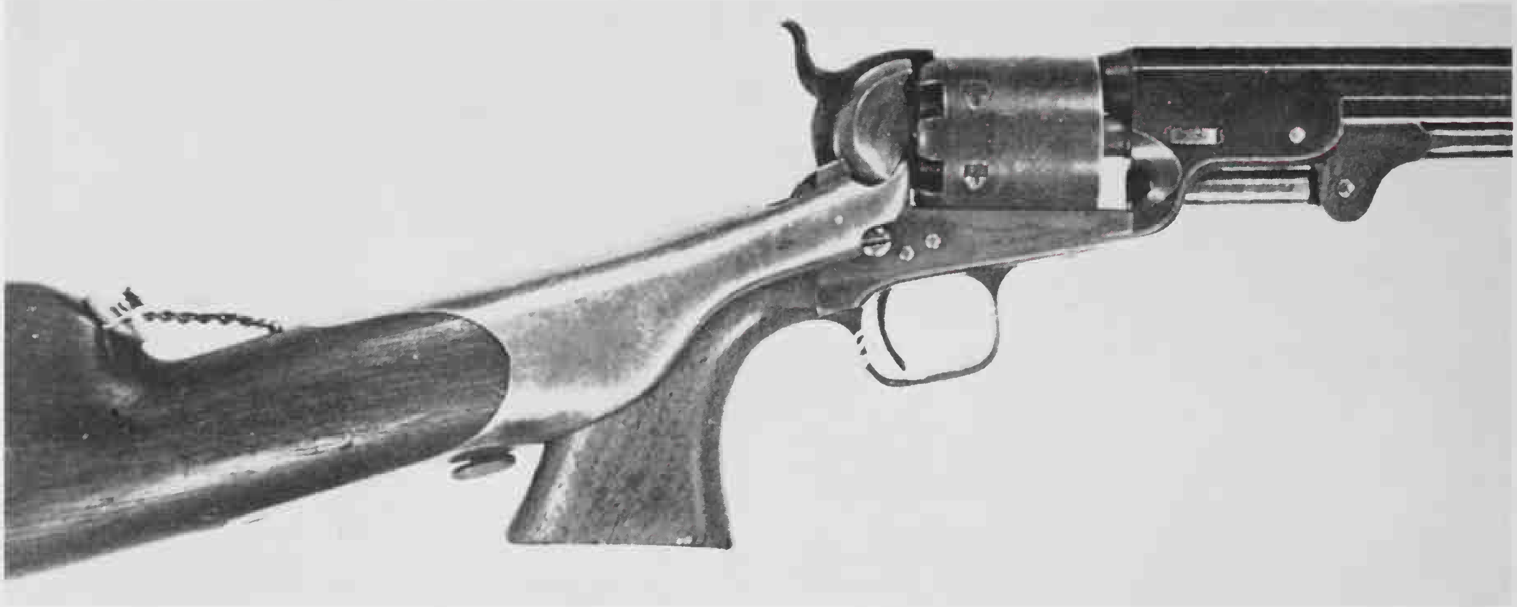
Copy of the Engraving on the Cylinder of COLTS Pocket Pistol

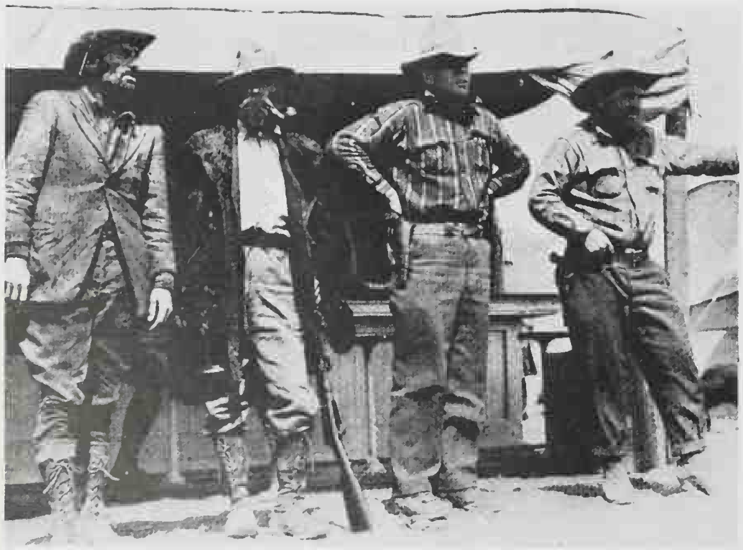
Colts Patent Repeating Pistols.

Manufactured at HARTFORD CONN

BEWARE OF COUNTERFEITS & PATENT INFRINGEMENTS





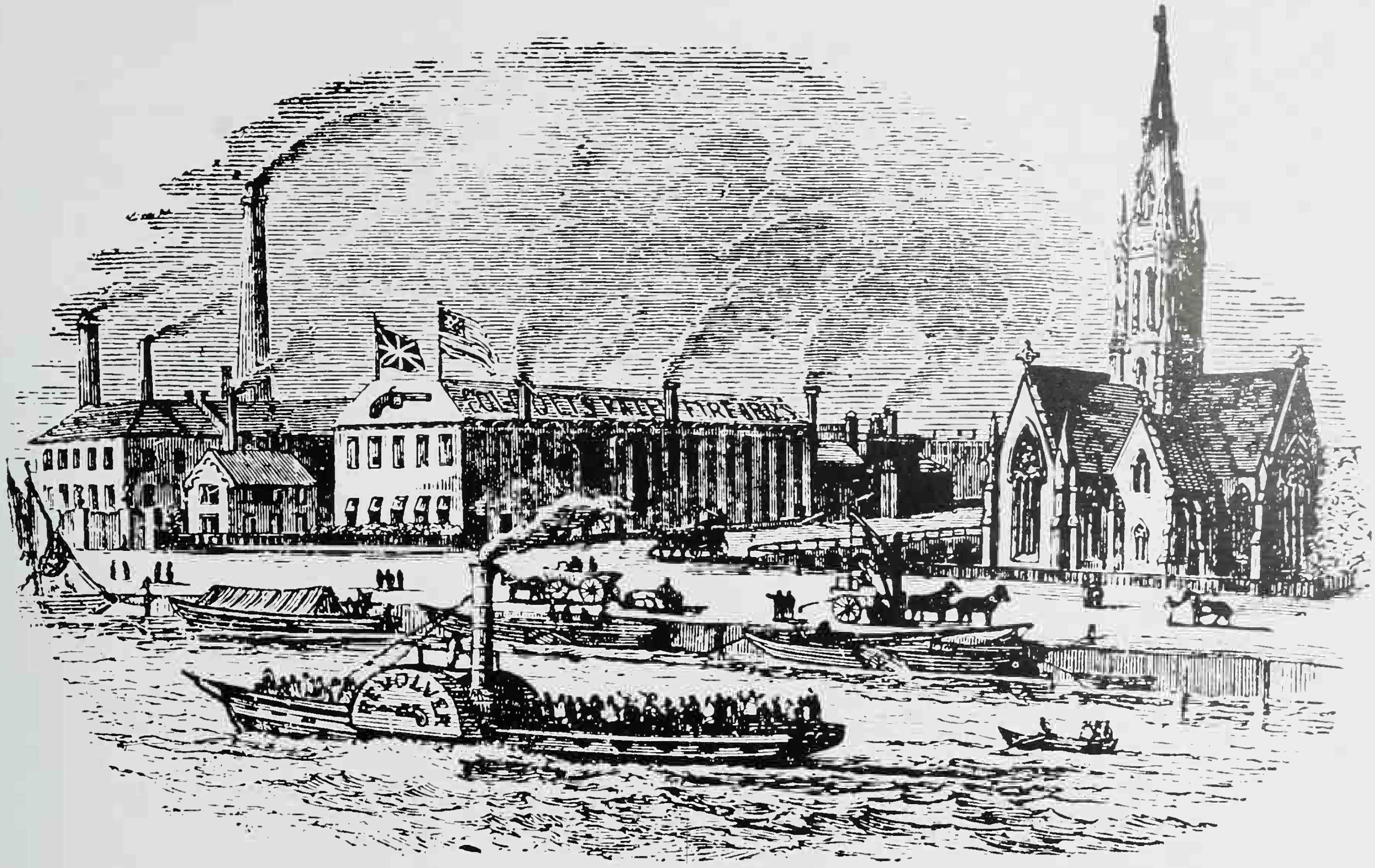


Clockwise from immediate above: **The sidearms worn by these cowpokes in this 1927 photo are Colts, underscoring Colt's continued popularity; an Old Model Navy Pistol with shoulder stock; an Old Model Army Pistol, also equipped with a shoulder stock; the Colt London factory, at which the 1849 Model Pocket Pistol and the 1851 Navy Pistol were made; and a pamphlet advertising Colt's London models.**

the long run, to hire expensive men than to hire cheap ones of lesser talents. Indeed, this kind of thinking led Colt to pay his better class workmen $5.00 a day, which at that time was roughly five times the going rate for such labor. But when high wages are paid, high demands can be made and the workers and management at the Hartford Plant lived up to all expectations. Arms were produced rapidly and efficiently. Marketing and advertising schemes, principally under Colt's direction, increased the reputation of Colt's firearms and his markets and orders grew at an astonishing rate.

The United States was not the only nation involved in conflict. This Colt knew and on foreign trips he managed to come in contact with heads of state then involved in regional wars. One such foreign leader was the Sultan of Turkey. Colt presented him with a pair of presentational revolvers, which led the Sultan to immediately order 5000 such arms and make to Colt a personal present of a jewel encrusted gold snuffbox. Later, Colt was to be the recipient of an Order of Turkish Nobility decoration from this same sultan.

Even though the designation 'Colt's Patent' appeared on Colt's firearms, there were always those ready to imitate the genuine article for their own profit. Fortunately, Colt was

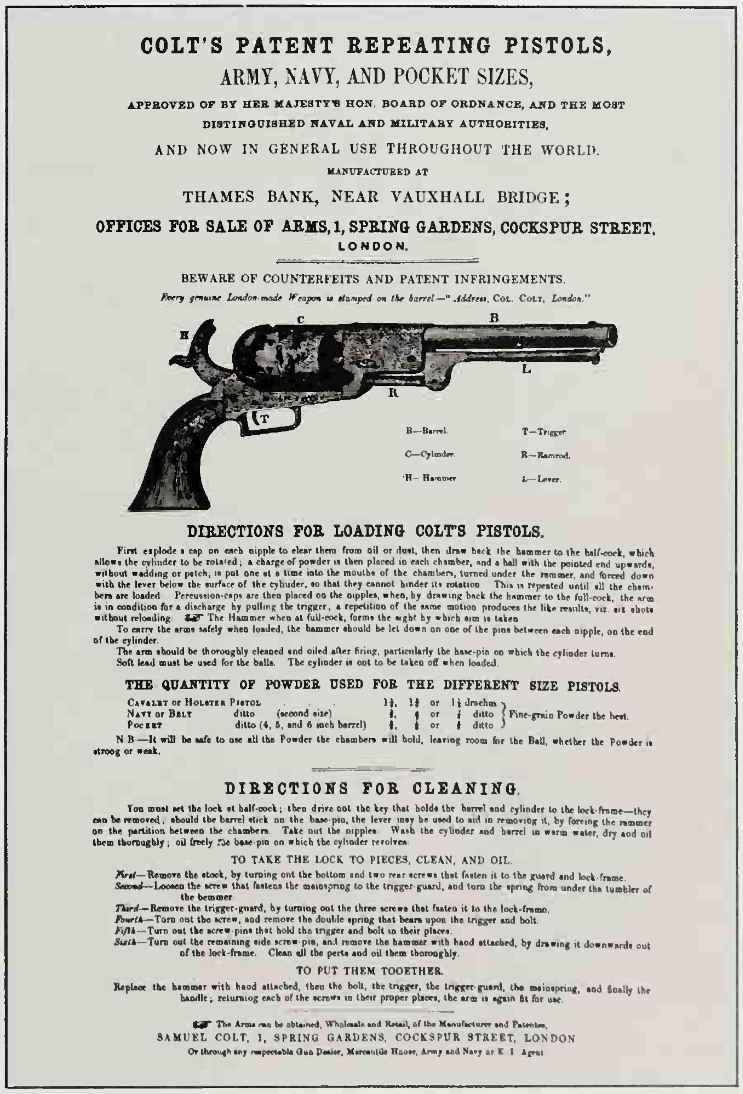


now wealthy enough to employ a battery of lawyers, who pursued these patent infringements vigorously. Colt's patents basically incorporated three principles in revolver construction: 1) turning the cylinder by the action of cocking the hammer, 2) locking and unlocking the cylinder by the same action of cocking and 3) providing a block between the chambers to prevent simultaneous discharge of several chambers. The infringers always lost and as long as Colt's patent remained intact, they had to search elsewhere for designs.

In 1851, Colt had gone to Europe and had given a series of lectures before the Institute of Civil Engineers at London. These lectures and the ensuing discussions turned into a litany of praise for Colt and his new pistols. The British, at this time, being 'the rulers of the world' had ample need for the latest in weaponry in order to quash the local uprisings, disturbances and disputes that almost continually plagued the Empire.

Colt set up a pistol factory in London in 1853 in order to exploit this market. It was situated at Pimlico on the Thames Bank near Zaruxall Bridge. The arms models made here were the 1849 Model Pocket Pistol and the 1851 Navy Pistol.

Since gunmaking in the British Isles at this time was mainly a piecemeal project, whereby a gun was produced in many different locations—usually backstreet workshops—the London Colt Factory was the source of great amazement to English observers. Not only were all of Colt's guns made under one roof, but the machinery used was of such perfection and precision that it could be run by women whose only former training had been in needlework. The London Factory was all the rage for British society and even Charles Dickens wrote of his tour through it in *Household Words* in 1855.



COLT'S PATENT REPEATING PISTOLS,

ARMY, NAVY, AND POCKET SIZES,

APPROVED OF BY HER MAJESTY'S HON. BOARD OF ORDNANCE, AND THE MOST DISTINGUISHED NAVAL AND MILITARY AUTHORITIES,

AND NOW IN GENERAL USE THROUGHOUT THE WORLD.

MANUFACTURED AT

THAMES BANK, NEAR VAUXHALL BRIDGE;

OFFICES FOR SALE OF ARMS, 1, SPRING GARDENS, COCKSPUR STREET, LONDON.

BEWARE OF COUNTERFEITS AND PATENT INFRINGEMENTS.

Every genuine London-made Weapon is stamped on the barrel—" Address, COL. COLT, *London.*"

B—Barrel.
C—Cylinder.
H—Hammer.
T—Trigger.
R—Ramrod.
L—Lever.

DIRECTIONS FOR LOADING COLT'S PISTOLS.

First explode a cap on each nipple to clear them from oil or dust, then draw back the hammer to the half-cock, which allows the cylinder to be rotated; a charge of powder is then placed in each chamber, and a ball with the pointed end upwards, without wadding or patch, is put one at a time into the mouths of the chambers, turned under the rammer, and forced down with the lever below the surface of the cylinder, so that they cannot hinder its rotation. This is repeated until all the chambers are loaded. Percussion-caps are then placed on the nipples, when, by drawing back the hammer to the full-cock, the arm is in condition for a discharge by pulling the trigger, a repetition of the same motion produces the like results, viz. six shots without reloading. ☞ The Hammer when at full-cock, forms the sight by which aim is taken.

To carry the arms safely when loaded, the hammer should be let down on one of the pins between each nipple, on the end of the cylinder.

The arm should be thoroughly cleaned and oiled after firing, particularly the base-pin on which the cylinder turns.

Soft lead must be used for the balls. The cylinder is not to be taken off when loaded.

THE QUANTITY OF POWDER USED FOR THE DIFFERENT SIZE PISTOLS.

CAVALRY OR HOLSTER PISTOL		1¼,	1⅜	or	1½ drachm.	Fine-grain Powder the best.
NAVY OR BELT	ditto (second size)	[illegible],	[illegible]	or	[illegible] ditto	
POCKET	ditto (4, 5, and 6 inch barrel)	[illegible],	[illegible]	or	[illegible] ditto	

N B—It will be safe to use all the Powder the chambers will hold, leaving room for the Ball, whether the Powder is strong or weak.

DIRECTIONS FOR CLEANING.

You must set the lock at half-cock; then drive out the key that holds the barrel and cylinder to the lock-frame—they can be removed; should the barrel stick on the base-pin, the lever may be used to aid in removing it, by forcing the rammer on the partition between the chambers. Take out the nipples. Wash the cylinder and barrel in warm water, dry and oil them thoroughly; oil freely the base-pin on which the cylinder revolves.

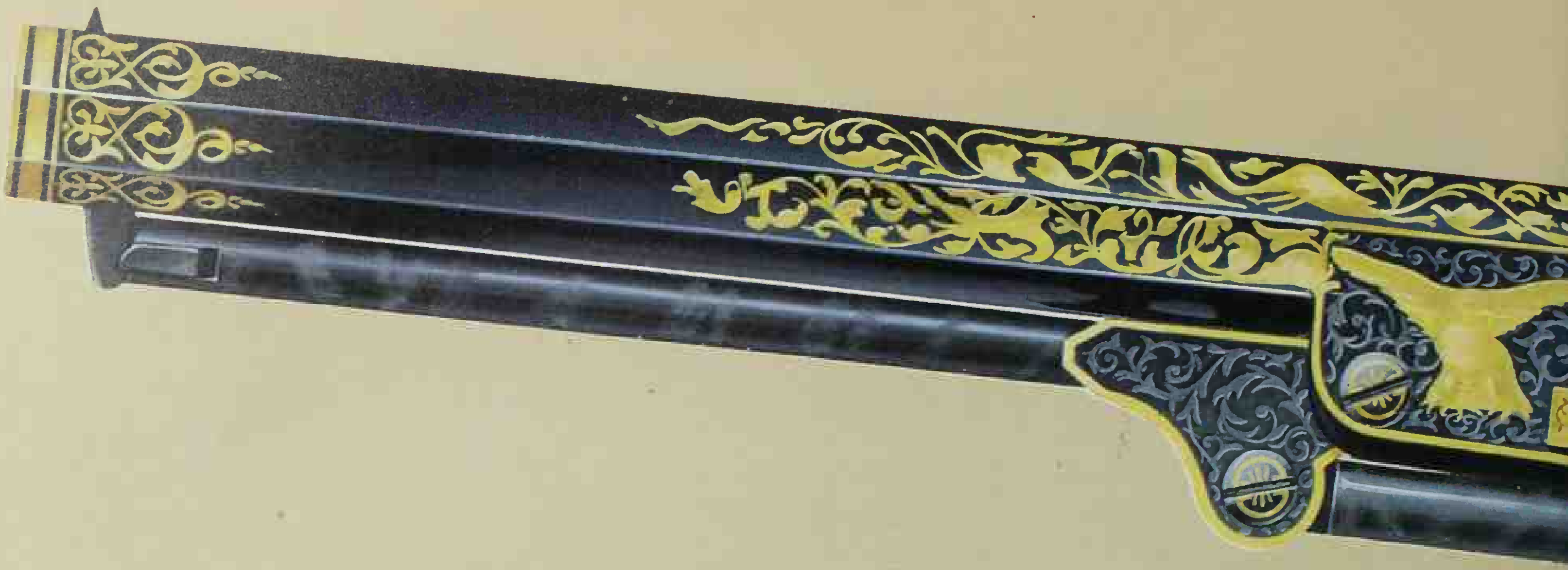
TO TAKE THE LOCK TO PIECES, CLEAN, AND OIL.

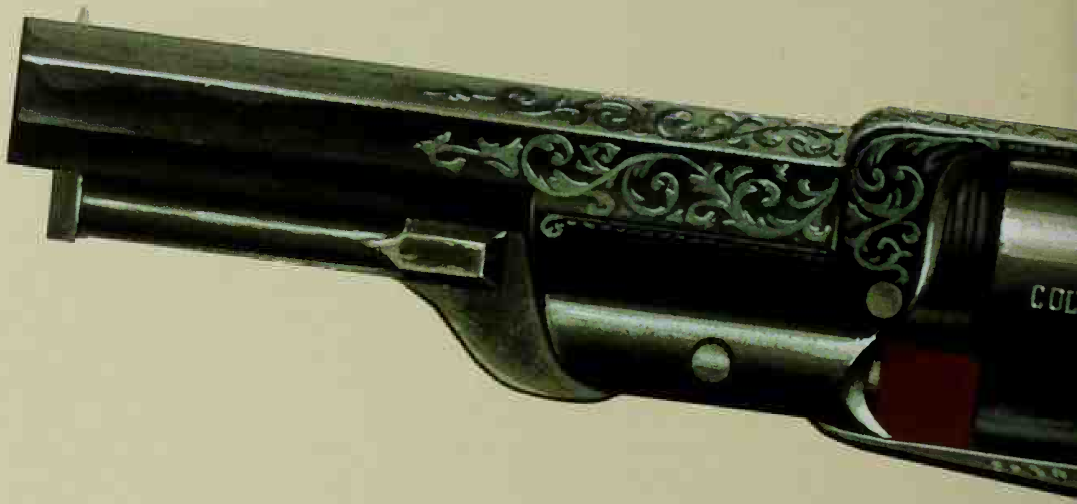
First—Remove the stock, by turning out the bottom and two rear screws that fasten it to the guard and lock-frame.
Second—Loosen the screw that fastens the mainspring to the trigger-guard, and turn the spring from under the tumbler of the hammer.
Third—Remove the trigger-guard, by turning out the three screws that fasten it to the lock-frame.
Fourth—Turn out the screw, and remove the double spring that bears upon the trigger and bolt.
Fifth—Turn out the screw-pins that hold the trigger and bolt in their places.
Sixth—Turn out the remaining side screw-pin, and remove the hammer with hand attached, by drawing it downwards out of the lock-frame. Clean all the parts and oil them thoroughly.

TO PUT THEM TOGETHER.

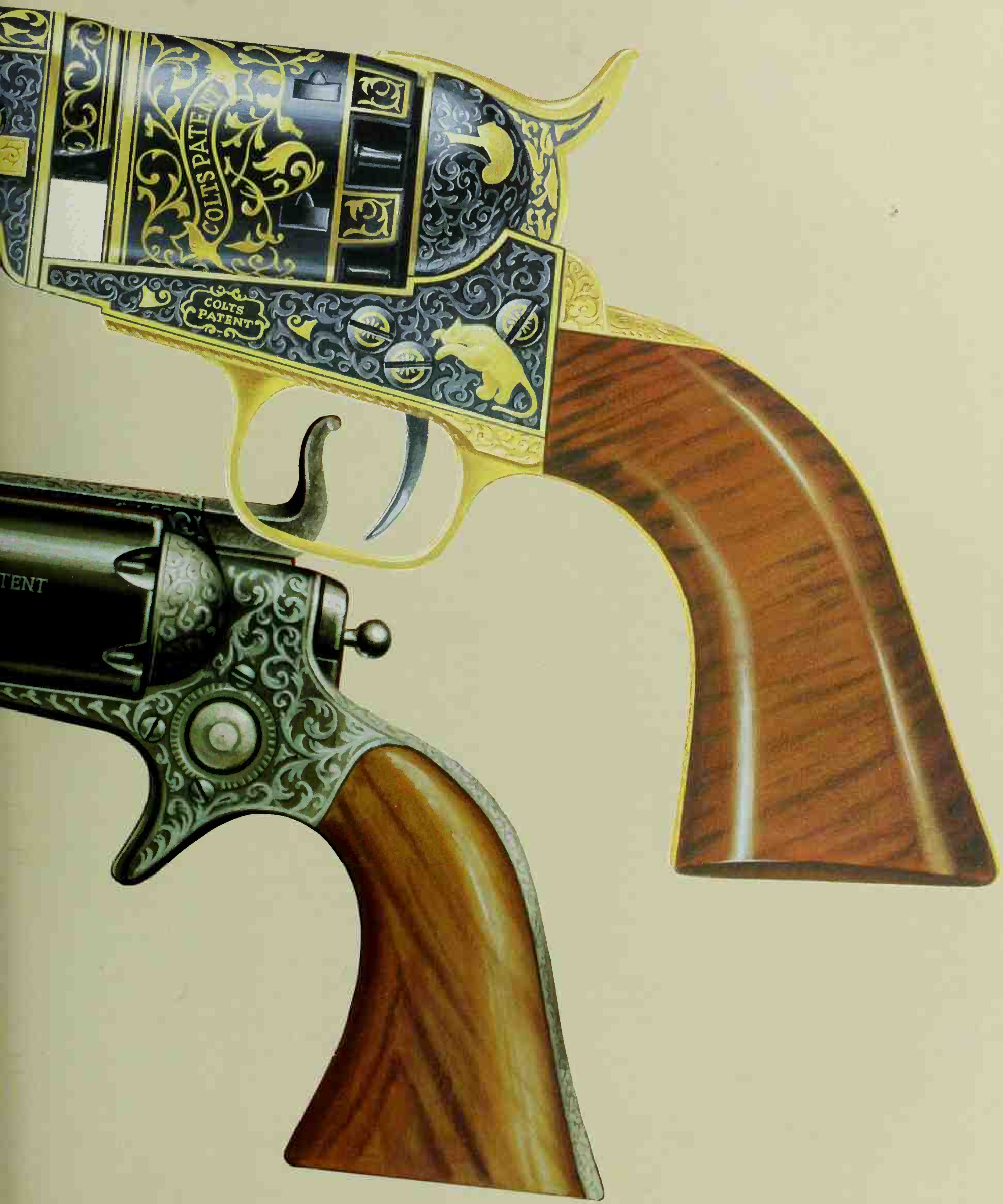
Replace the hammer with hand attached, then the bolt, the trigger, the trigger-guard, the mainspring, and finally the handle; returning each of the screws in their proper places, the arm is again fit for use.

☞ The Arms can be obtained, Wholesale and Retail, of the Manufacturer and Patentee,
SAMUEL COLT, 1, SPRING GARDENS, COCKSPUR STREET, LONDON
Or through any respectable Gun Dealer, Mercantile House, Army and Navy or E. I. Agent




COL

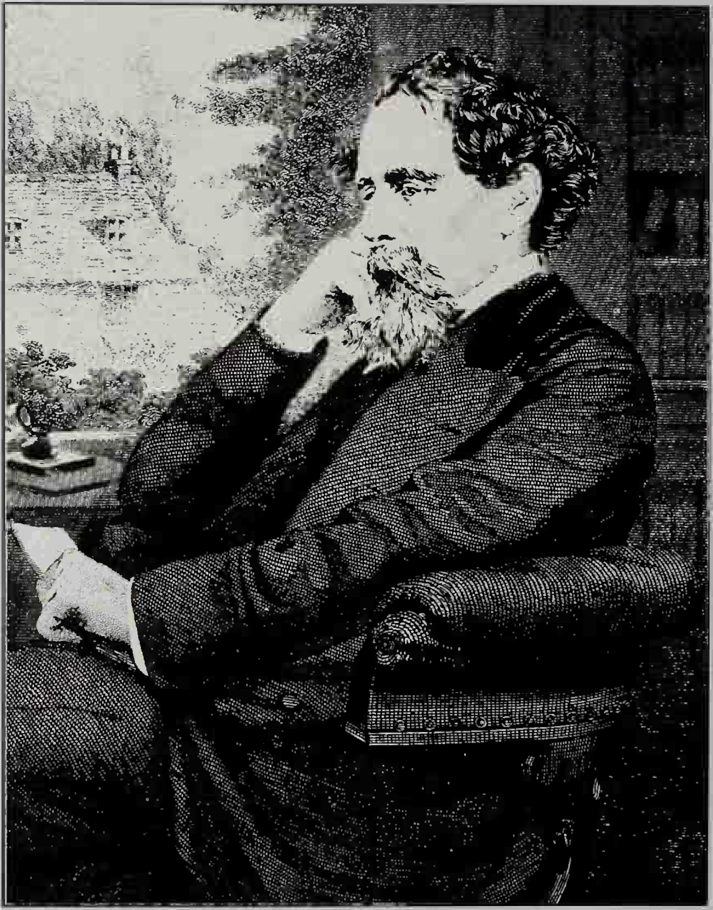
These pages, top to bottom: **An ornate Old Model Navy Pistol, (such pistols were given as gifts to influential people); an engraved New Model Pocket Pistol 'sidehammer Colt,' circa 1855; and a London Colt.**


COLTS PATENT
COLTS PATENT
TENT

Charles Dickens Tours Colt's Ill-Fated London Factory (1855)

We are on the threshold of Colonel Colt's factory in the somber and smoky region of Millbank. Under the roof of this low, brickbuilt, barrack-looking building, we are told that we may see what cannot be seen under one roof elsewhere in all England, the complete manufacture of a pistol, from dirty pieces of timber and rough bars of cast steel, till it is fit for the gunsmith's case. To see the same thing in Birmingham and in other places where firearms are made almost entirely by hand labour, we should have to walk about a whole day, visiting many shops carrying on distinct branches of the manufacture; not to speak of the toolmakers, the little screw and pin makers; all of whose work is done here. 'We are independent people,' says my informant, 'and are indebted to no one, save the engine and fixed machine makers.' This little pistol which is just put into my hand will pick into more than 200 parts, every one of which parts is made by a machine. A little skill is required in polishing the wood, in making cases, and in guiding the machines; but mere strength of muscle, which is so valuable in new societies, would find no market here, for the steam engine—indefatigably toiling in the hot, suffocating smell of rank oil, down in the little stone chamber below—performs nine-tenths of all the work that is done here. Neat, delicate-handed little girls do the work that brawny smiths still do in other gunshops. Most of them have been seamstresses and dressmakers, unused to factory work, but have been induced to conquer some little prejudice against it, by the attraction of better pay than they could hope to get by needlework. Even the men have, with scarcely an exception, been hitherto ignorant of gunmaking. No recruiting sergeant ever brought a more miscellaneous group into the barrack-yard, to be drilled more rapidly to the same duty, than these 200 hands have been. Carpenters, cabinet-makers, ex-policemen, butchers, cabmen, hatters, gas-fitters, porters—or at least one representative from each of those trades—are steadily drilling and poring at lathes all day in upper rooms.

The girls here earn from two to three shillings per day; the boys the same. The men get from three to eight shillings per day of 10 hours; while one or two, being quick, clever and reliable, are paid regularly 12 shillings per day. What is commonly called piecework is not the system usually adopted here. It has been found to tempt the men to hurry their work at the expense of a neat finish, and the manager prefers to give a workman six months trial, during which he learns the business of gunmaking by machinery, and he is also sure by that time to have shown what wages he is worth. Only 12 of these people are Americans; one or two Germans, the rest English.



Above: **Charles Dickens—perhaps pondering Colt's unique London factory, whose mass-production techniques were much different than any manufacturing process with which English gunsmiths were acquainted.**

Listening to these facts as my conductor communicates them, we pass into a long room hung with portraits of targets as they appeared after firing at them with Colt's revolvers. All the bullet marks are, of course, very near the bull's eye—which, I hope I am not presumptuous or depreciatory of the great Colt invention in attributing in some measure to the marksman. Beyond this is the storeroom, lined with wooden racks up to the ceiling, which are almost naked now, only five pistols of all the number that are made here—600 a week—being at the moment in store.

Out of the hot atmosphere, and the all-pervading odor of hot oil, we pass a yard ankle deep in iron chips (which make a dry hard road in all weathers, very destructive to leather) into a long outbuilding in which the only genuine smiths are at work. Here the very beginning of the pistols is made—if we except the cutting and polishing of the stock, which have been already described in these pages. There is little of the noise of a smithy here, except the roaring of the furnaces. A workman rams the end of a long bar of steel into the fire, and taking it out glowing with heat, strikes a bit off the end as if it were a stick of peppermint, while his companion—giving it a couple of rough taps upon the anvil—drops the red hot morsel into a die. This die is a plug hole, shaped something like a horseshoe, at the foot of a machine bearing a painful resemblance to a guillotine. While they have been breaking off the bit of steel, a huge screw has been slowly lifting up the iron hammerhead, which plays the part of the axe in the guillotine; and now the great hammer drops, and with one stroke beats the piece of iron to the form of the die. It has cooled to a black heat now, and is shaped something like the sole of a narrow shoe; but it must be heated again and the heel end beat up at right angles to the long part—taking care that it is bent according to the grain of the metal, without which it will be liable to flaw. Thus the shield, and what may be called the body of the pistol, are made in an instant.

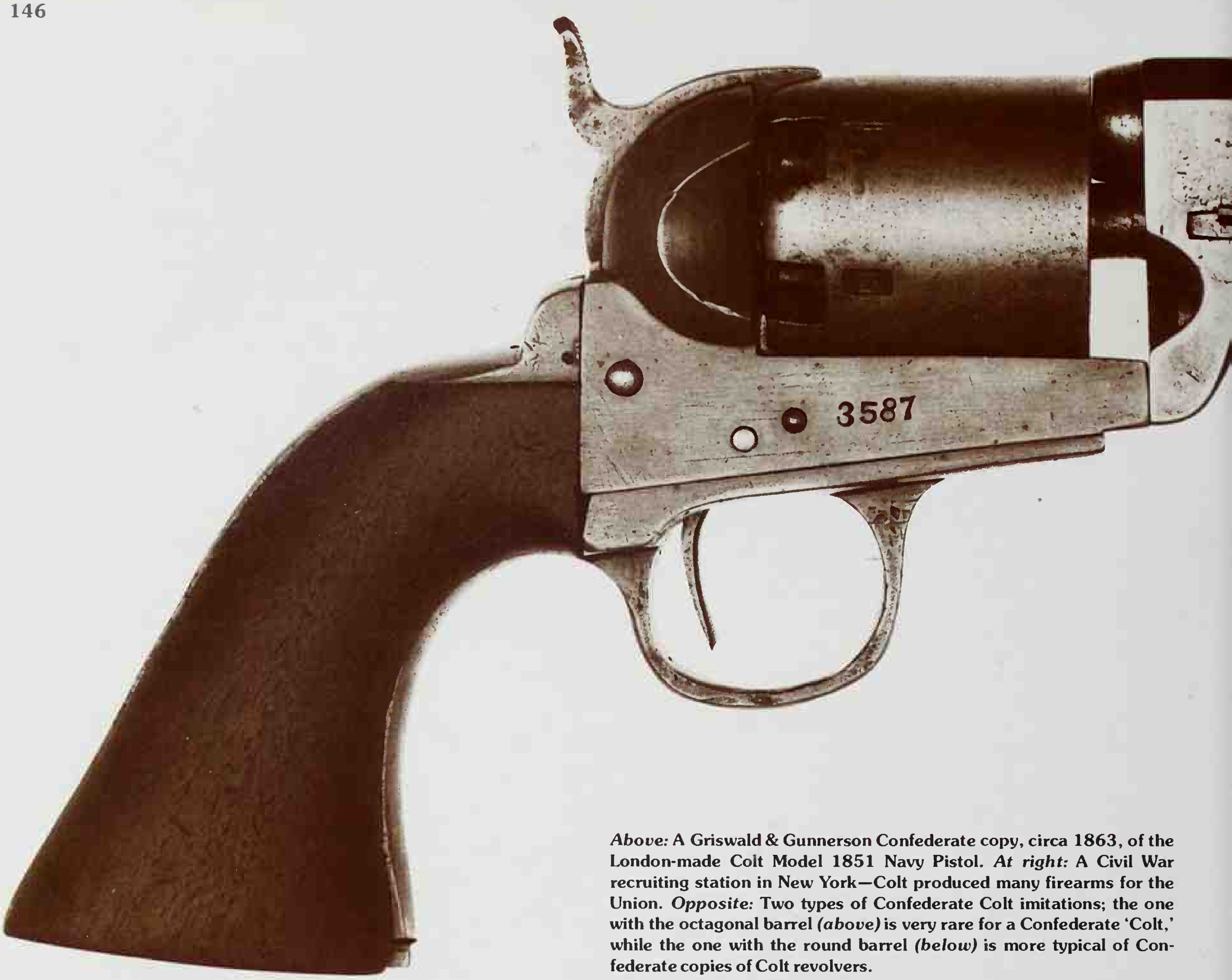
In Birmingham, the barrels of firearms are made of old nails that have been knocked about, and which are melted, rolled into sheets, twisted again, and beaten about till they are considered to be tougher and less likely to burst—but the American gunsmiths know nothing about this. They merely beat it with steam hammers; for it would not do to draw it through holes, as thick wire is drawn, or to roll it as with ordinary round bars. These hammers are fixed, five in a frame, where they quiver with a chopping noise too rapidly to count the strokes, over a little iron plate, never touching it, though coming very close. Into the first of these the smith thrusts the red end of the bar, and guides it till it is beaten square. The next hammer beats it smaller, but still square. The next beats it smaller and longer still, but rounder. The fourth hammer beats it round, and the fifth strikes off the exact length for the barrel. This gradual process is absolutely necessary, for the steel will not bear being beaten round the first time; and, although five barrels may be thus forged in one minute, the rapid strokes of these hammers are said to make it quite as tough as the Birmingham plan; which seems to be borne out by the results at the proof-house. On the same floor, the barrels and cylinders, after polishing, are casehardened and tinted blue by burning in hot embers—processes which are well known.

Across the yard strewn with chips of iron again, and through the tool room, where men are turning great screws and other bolts and portions of machinery, we mount to the first floor and enter a long room filled with machines, and rather more redolent of hot rank oil. Considering that the floor supports a long vista of machinery in full action, the place looks clean and neat, and is not very noisy. Girls quietly attending to the boring and rifling of the barrels—having nothing to do but to watch the lathe narrowly, and drop a little oil upon the borer with a feather now and then—men drilling cylinders, holding locks to steam files, cutting triggers, slotting screws, treating cold iron everywhere as if it were soft wood, to be cut to any shape, without straining a muscle. It would be difficult and tedious to describe these machines minutely, although they are very interesting to a spectator, and cannot, I believe, be seen elsewhere. Every one of them is a simple lathe; but it is in the various cutters, borers and riflers that the novelty and ingenuity exist. Where the thing is to be made of eccentric shape, the cutter is of eccentric shape also; and although the superintendent of each machine acquires more or less skill by practice, it is in the perfection of these cutters and borers that the guarantee for uniformity consists. The bores of barrels and cylinders must be mathematically straight, and every one of the many parts must be exactly a duplicate of another. No one part belongs, as a matter of course, to any other part of one pistol; but each piece may be taken at random from a heap, and fixed to and with the other pieces until a complete weapon is formed, that weapon being individualized by a number stamped upon many of its component parts. The advantage of these contrivances is obvious. In every case of revolvers are placed, when sold, a number of such parts of a pistol as are most liable to accident; and with these, any soldier or sailor may, in a few minutes, repair his own weapon.

All this time we have been seeing only the making of little bits of a pistol. Pausing for a moment to see the engraving of a ship in full sail, and other ornamental work—including the maker's name stamped by great pressure on the cylinder—we come into a great room, where all the minute portions are brought to be examined. Here, by means of gauges, but chiefly by the practised eye of the superintendent, each separate article is examined, and rejected if in the slightest degree faulty. From this room the various parts are served out to the workmen who put them together and turn out the complete revolver.

Here is the proving room; where the pistols undergo a preparatory trial, before being sent up for the regular government proof. It is by no means the dark, mysterious iron-plated room in which I have been taught to believe that guns are proved, but an ordinary workshop, with two square wooden pipes, fixed horizontally, and open at the end, breast high. I am invited to prove a pistol, by firing it into one of these pipes which, I am told, afford sufficient protection to the firer in case of a barrel bursting—an event, pains were taken to assure me, of very rare occurrence. After a little practice, I find that a mere novice may, with one hand, discharge the six rounds as rapidly as the eye can wink.

—Charles Dickens
Household Words (Chapter 15, Volume 9)



Above: **A Griswald & Gunnerson Confederate copy, circa 1863, of the London-made Colt Model 1851 Navy Pistol. *At right:* A Civil War recruiting station in New York—Colt produced many firearms for the Union. *Opposite:* Two types of Confederate Colt imitations; the one with the octagonal barrel *(above)* is very rare for a Confederate 'Colt,' while the one with the round barrel *(below)* is more typical of Confederate copies of Colt revolvers.**

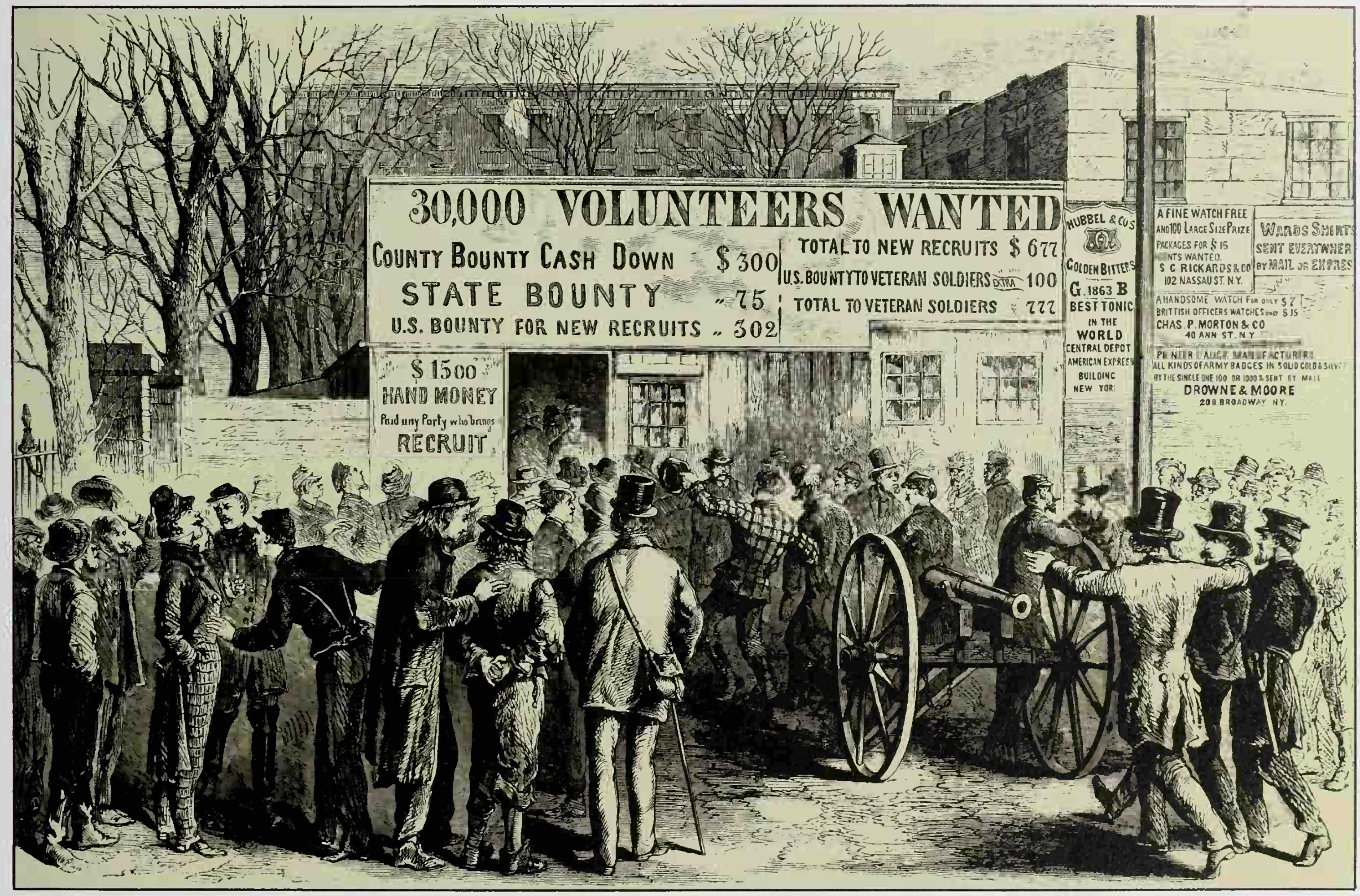
In 1854, the British government contracted with Colt to produce both large orders of revolvers and of the machinery for the manufacture of muskets.

Colt's genius was not confined merely to inventiveness and public relations. He was an organizer and a manager of the highest grade. He recognized almost from the beginning that in the production of a firearm, some pieces of the gun require more skill to produce than others. Obviously, if the fabrication of one firearm is assigned to one individual, that individual will have to be paid according to the most skilled labor required for those particular parts composing the gun. This was unfair, both to Colt and the employee, as well as the customer. The work, therefore, was divided into various divisions depending on the precision or skill required to produce the individual parts. Pay was graduated according to each worker at the skill level at which he functioned. A system of subcontracting was employed whereby the less skilled workman ran the basic machines and did the routine work while the more skilled men did the actual assembling of the arms and their final finishing.

Because all of the parts of a particular model of gun had to be interchangeable with other specimens of that same model, precision was of the utmost importance. This need led Colt to institute the standardization of gauges used in calibrating the machinery upon which the parts were produced. This meant that, standardization being assured, workmen were able to be paid according to their ability to produce. Henry Ford is traditionally credited with this kind of assembly line process, but it was Colt who had the basic concepts in mind—and in operation—long before Ford came onto the American scene. Only 10 percent of the cost of a given weapon was generally taken up with the wages of the men who ran the machines. Thus, Colt's profitably increased, yet he was able to sell his 'perfect' weapons at a very reasonable price.

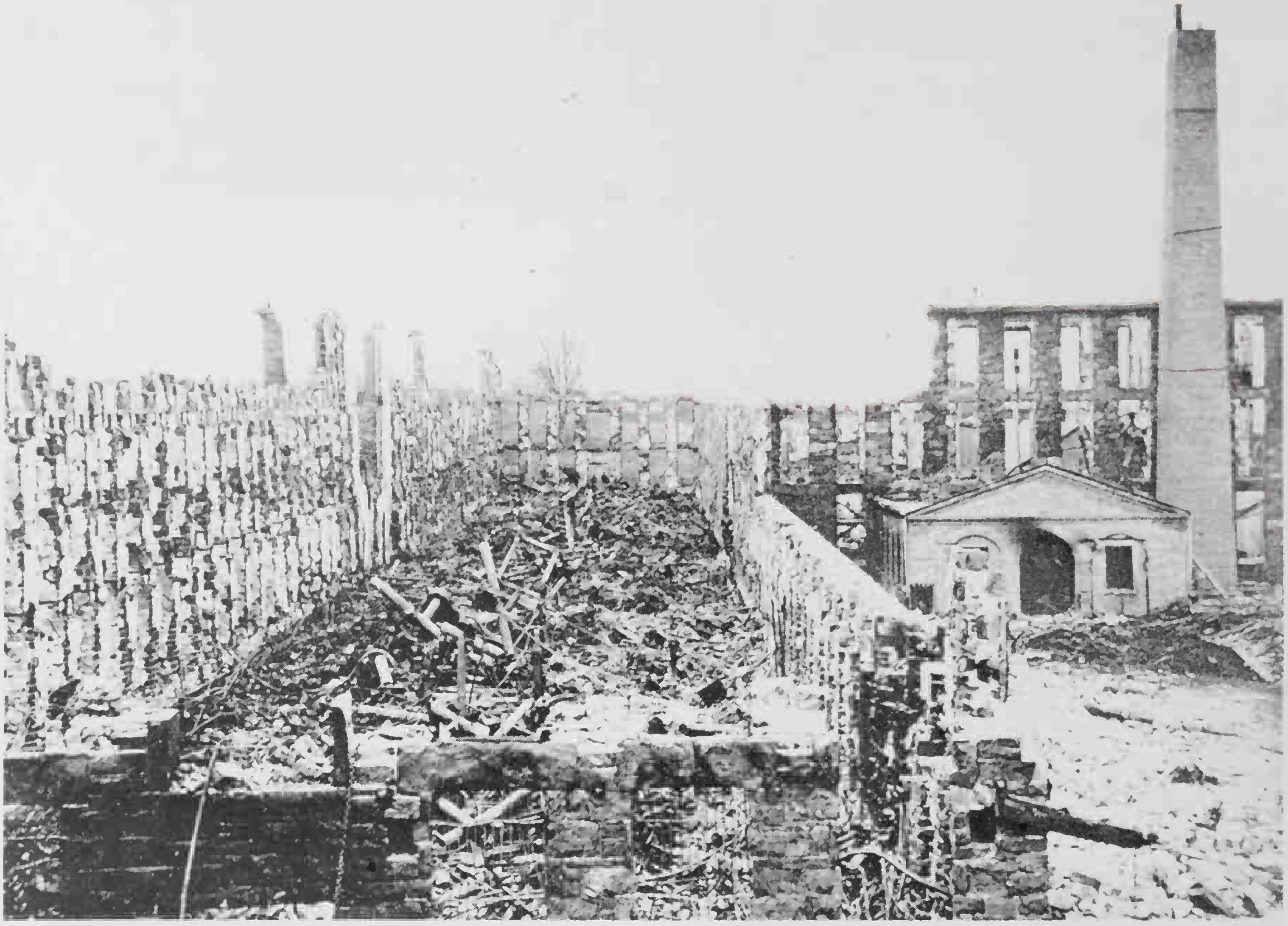
All of these mass production techniques and the ideas and attitudes behind them were purely of American vintage. The British employees of Colt's factory in London could never seem to adjust themselves to such processes. Consequently, the London branch of Colt's factory closed in 1857. It was bought by others who attempted to produce Colt's pistols, but if Colt could not make the factory run, no one could. In a short time, the London Pistol Company ceased to exist.

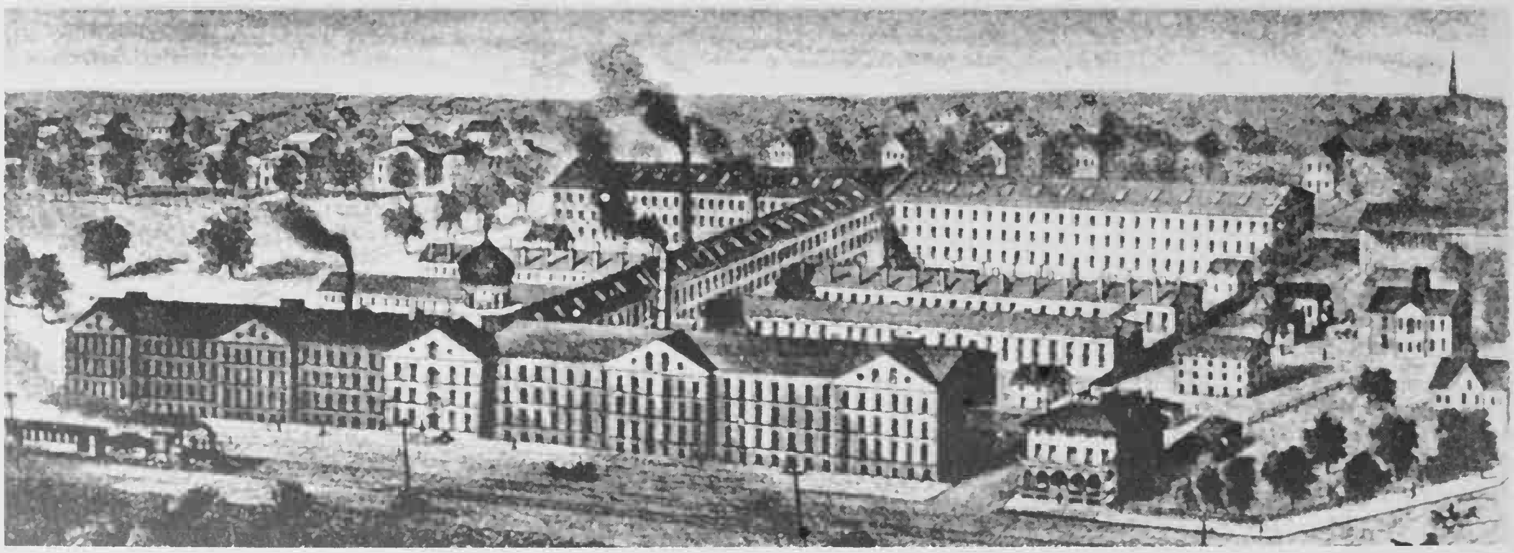
But if Colt's English venture had not proven to be so profitable, his foresight and insight into the political instability of the US did. Colt sensed that because of the slavery issue and other economic factors, the North and the South would almost inevitably go to war. That conflict, he knew, would test the very existence of the Union itself. Being a Connecticut Yankee by birth and owing his success


30,000 VOLUNTEERS WANTED
COUNTY BOUNTY CASH DOWN $300
STATE BOUNTY " 75
U.S. BOUNTY FOR NEW RECRUITS " 302
TOTAL TO NEW RECRUITS $677
U.S. BOUNTY TO VETERAN SOLDIERS EXTRA 100
TOTAL TO VETERAN SOLDIERS " 777
$1500 HAND MONEY Paid any Party who brings RECRUIT
HUBBEL & CO'S GOLDEN BITTERS G. 1863 B BEST TONIC IN THE WORLD CENTRAL DEPOT AMERICAN EXPRESS BUILDING NEW YORK
A FINE WATCH FREE AND 100 LARGE SIZE PRIZE PACKAGES FOR $15 NTS WANTED. S C RICKARDS & CO 102 NASSAU ST. N.Y.
WARDS SHIRTS SENT EVERYWHER BY MAIL OR EXPRES
A HANDSOME WATCH FOR ONLY $7 BRITTISH OFFICERS WATCHES ONLY $15 CHAS. P. MORTON & CO 40 ANN ST. N.Y.
ALL KINDS OF ARMY BADGES IN SOLID GOLD & SILVER BY THE SINGLE ONE 100 OR 1000 & SENT BY MAIL DROWNE & MOORE 208 BROADWAY N.Y.

to the American enterprise in general, Colt undertook to have his Hartford Factory work literally night and day to produce for the US Government in advance of the anticipated hostilities. He wrote to Mr Root, his general manager, to get '5000 or 10,000 ahead of each kind of firearm in production.' He wanted his people to 'make hay while the sun shines.' This they were able to accomplish by working double shifts. And since supply lines were—at this point in time—still undisturbed, the flow of raw materials for the arms were still easily accessible. Thus, when hostilities broke out, Colt was able to supply the government with its immediate and long range needs. By 1862, the Colt plant was, indeed, 'making hay while the sun shines.'

However, the frenzied pace of production had taken its toll on Samuel Colt. He had suffered a personal blow when one of his daughters died and this, combined with his desire to furnish the Union troops with all of the weapons that they needed, led him into a condition of nervous exhaustion. On

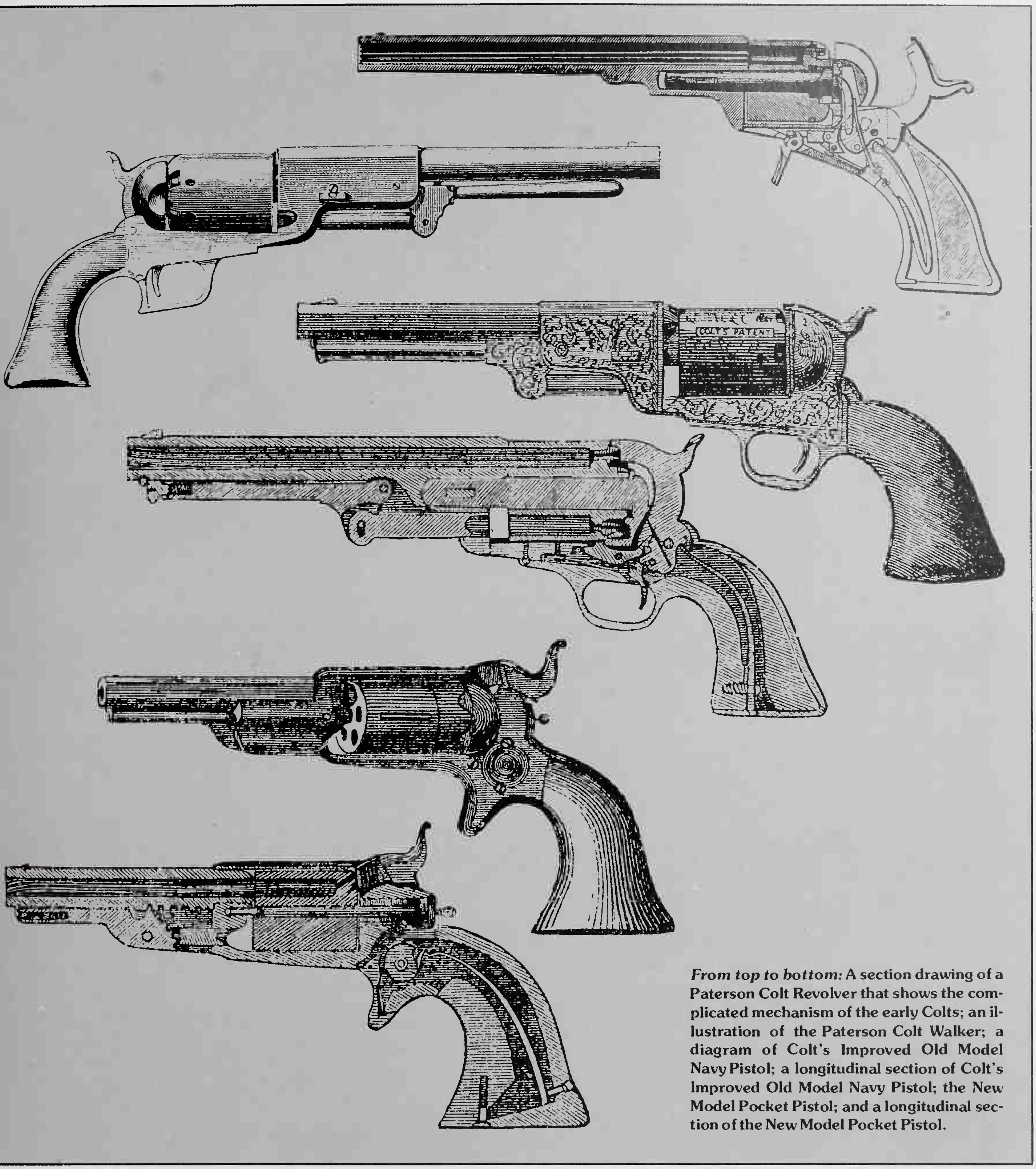




***At top:* Colt's Hartford plant after the fire of 1864. Confederate spies in the plant were suspected of arson. *Above:* Back in the swing of things—the Colt factory as it looked after the rebuilding of the burned factory—1874. See also the pre-fire factory photo on page 21.**

his death bed, he was making plans to increase the size and output of the Hartford Factory by two-fold. He even contracted with the government to furnish 75,000 single shot muskets in addition to the revolver orders already filed with him. Colonel Samuel Colt died on 10 January 1862, being only 48 years of age.

His estate consisted of over 100 acres of prime land in Hartford, the largest private armory in the world and a corporation with paid up capital of over $1,000,000. The total value of his estate was estimated at $5,000,000. All of this is the more amazing when one considers that these accomplishments were done in a 14 year period. Not only had Samuel Colt, during this time, supplied his nation with the kinds of weapons that it needed and in sufficient quantities and made for himself a fortune; he had also established a standard of employee welfare that, even by today's standards, would be considered phenomenal. Colt's employees



***From top to bottom:* A section drawing of a Paterson Colt Revolver that shows the complicated mechanism of the early Colts; an illustration of the Paterson Colt Walker; a diagram of Colt's Improved Old Model Navy Pistol; a longitudinal section of Colt's Improved Old Model Navy Pistol; the New Model Pocket Pistol; and a longitudinal section of the New Model Pocket Pistol.**

worked in heated, well-lit, ventilated rooms with running water and at the highest pay in the country for the class of work that they did. They were even provided with up-to-date homes and a recreation center for their off hours. As a result, their loyalty to him personally and to the company, was unbounded. EK Root was elected the president upon Mr Colt's death.

The last models of Colt revolvers which were introduced before Mr Colt's death were the 1860 Army, the 1861 Navy and the 1862 Police and Pocket Navy. In February 1864, fire swept the old armory of the Hartford plant. The precision machines and floors of the plant had been saturated with nearly 10 years of accumulated oil. Eyewitness accounts attest to the ferocity of the blaze. Historians have speculated about the cause of the fire and most attribute it to Confederate spies in the plant itself. The total loss was nearly three quarters of a million dollars which was partly covered by insurance. It is interesting to note that during Colt's lifetime he carried no insurance, but had never had to worry very much about arson. Luckily, the fire did not occur until near the very end of the Civil War and the plant's destruction did not affect the outcome of the conflict.

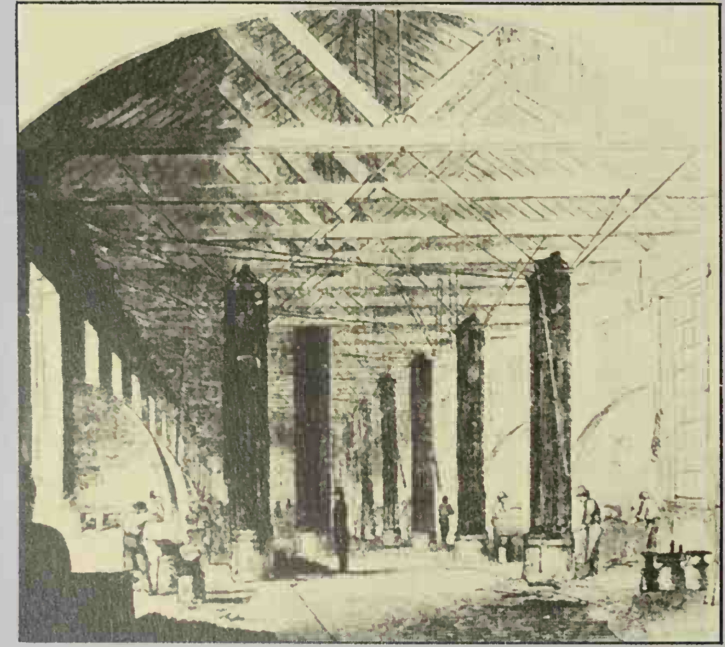
A Tour of Colt's Hartford Factory (1857)

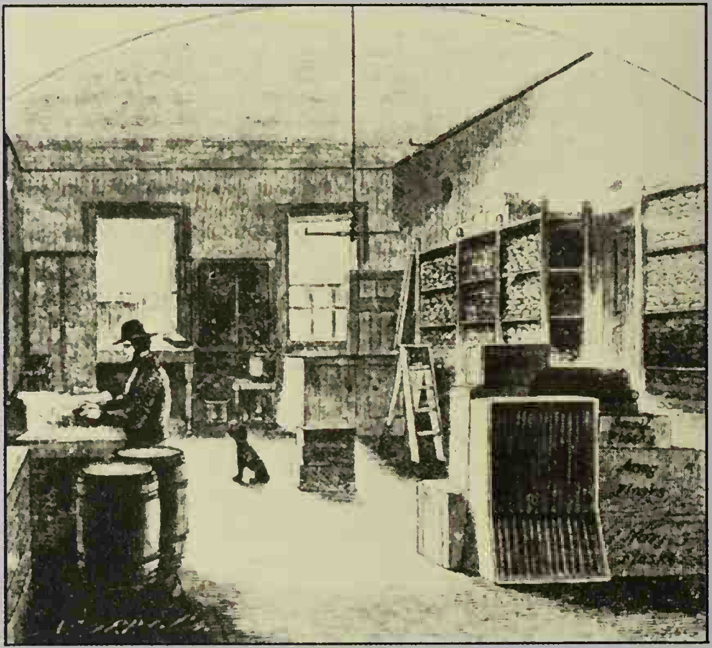
Leaving the office we cross the bridge, pass down through the machine shop, engine room, etc, to the rear parallel, an apartment 40 by 50 feet square, the center of which is appropriated as the storeroom for iron and steel. Large quantities of these materials, in bars and rods, are stored here in charge of a responsible party, whose duty it is to fill the orders from the contractors, and render an accurate statement of such deliveries to the main storekeeper's department. This latter system is universal throughout the establishment—thus, materials of all kinds can be readily accounted for, no matter what their state of transposition.

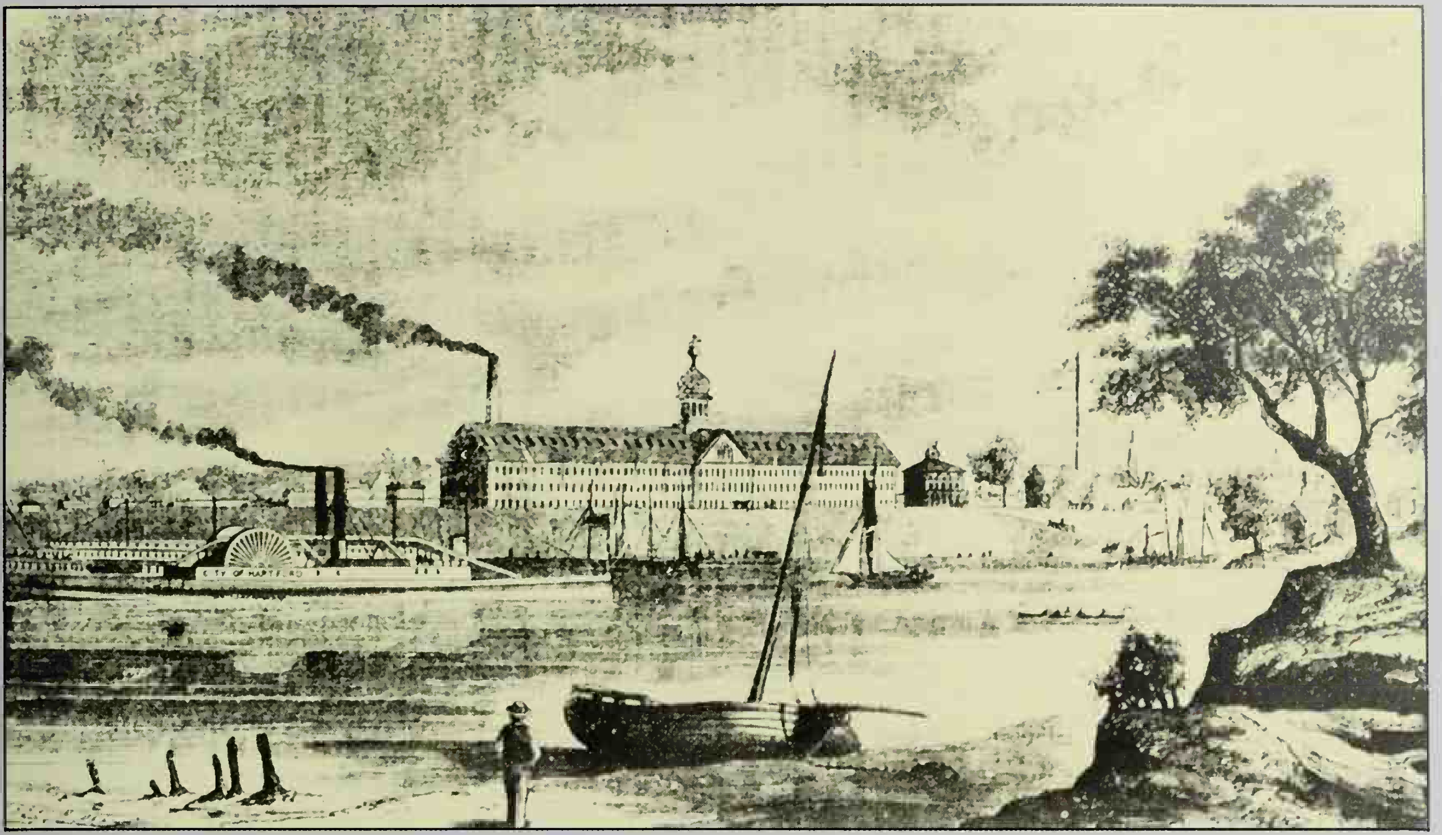
At this point it is well to inform the reader that almost the entire manual labor of the establishment is performed by contract. The contractors are furnished room, power, tools, material, heat, light—in fact all but muscle and brains; themselves, however, and their subordinates are all subject to the immediate government, as prescribed by the code of rules, laid down by the Company. The contractors number some scores—some particular manipulators requiring only their individual exertions, while others employ one to 40 assistants. Many of them are men of more than ordinary ability, and some have rendered themselves pecuniarily comfortable by their exertions.

We now pass into the forge shop, an apartment 40 by 200 feet square, comprising the whole of one arm of the parallel. Along each side range stacks of double-covered forges—the blasts for which, entering and discharging through flues in the walls, carry off the smoke and gases. Here, for the first time in our life, we were in a blacksmith shop in full operation, yet free from smoke and cinders, and with a pure atmosphere. Several kinds of hammers are used—those most in use, however, being 'drops' of the novel construction peculiar to the establishment; they are raised on the endless screw principle, and tripped by a trigger at the will of the operator. All the parts of the firearm composed of iron or steel are forged in swages, in which, although they may have ever so many preliminary operations, the shape is finally completed at a single blow. That some idea may be formed of the amount of work on a single rifle or pistol, we have determined to state the number of separate operations of each portion, and in each department. We adopt the 'Navy' or belt pistol, the weight of which is 38 ounces, as the example. In forging, the number of separate heats are enumerated: lockframe, two; barrel, three; lever, two; rammer, one; hammer two; hand, two; trigger, two; bolt, two; main spring, two; key, two; nipples, two each, 12; thus we find that no less than 32 separate and distinct operations, some of which contain in themselves several subdivisions, are required in the forging for a single pistol.

It is unnecessary to describe all the operations performed by the machines; a few will render the whole understandable. In all there are 36 separate operations before the cylinder is ready to follow the lockframe to the inspector. The barrel goes through 45 separate opera-







Touring Colt's Hartford factory—*opposite, left and right:* The Forging Shop and the Wareroom. *Above:* The dome-topped armory. This was no sweatshop—in fact, employees enjoyed unrivalled good working conditions for that era.

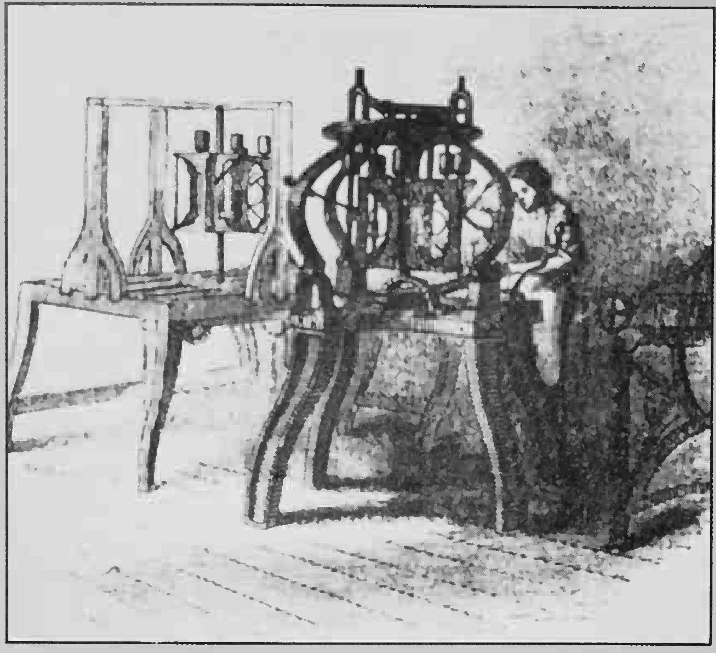
tions on the machines. The other parts are subject to about the following number: Lever, 27; rammer, 19; hammer, 28; hand, 20; trigger, 21; bolt, 21; key, 18; sear spring, 12; 14 screws, seven each, 98; six cones, eight each, 48; guard, 18; handlestrap, five; and stock, five. Thus it will be observed that the greater part of the labor is completed in this department. Even all the various parts of the lock are made by machinery, each having its relative initial point to work from, and on the correctness of which the perfection depends.

As soon as completed the different parts are carried to the story above, which, with the exception of machinery and columns through the center, is an exact counterpart of the room below. It is designated the Inspecting and Assembling Department. Here the different parts are most minutely inspected; this embraces a series of operations which in the aggregate amount to considerable work; the tools to inspect a cylinder, for example, are fifteen in number, each of which must gauge to a hair. The greatest nicety is observed, and it is absolutely impossible to get a slighted piece of work beyond this point. On finishing his examination, the inspector punches his initial letter on the piece inspected, thus pledging his reputation on its quality.

The mountings, consisting of the handlestrap and guard, which are composed of gunmetal, are cast and afterward worked up in the machines in the same manner as the other metal work. The woodwork of the stock is also shaped by machinery.

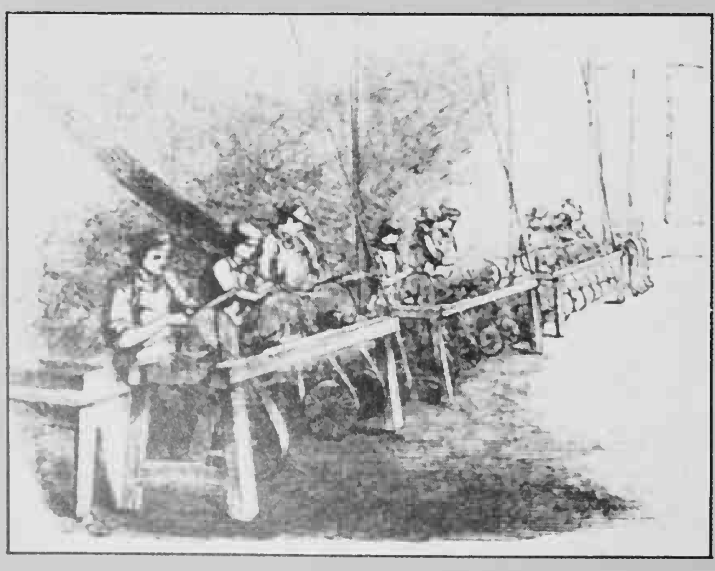
Each part having been thus far completed in itself, now comes the first uniting or 'assembling,' as the workmen term it. Let us get our Navy pistol in shape; to do so we will want a cylinder, barrel, lockframe, hammer, trigger, bolt, key, mainspring, hand, sear spring, lever, rammer, guard, back strap, stock and a number of peculiar screws. These are readily united by the assembler, and our pistol assumes its material shape, It is now numbered; to make it special, we will designate our number as 138,565; the imprint of the establishment, 'Address Colonel Sam Colt, Hartford, Conn' is also stamped on at this time. It is now carefully taken apart, all the pieces being stamped the particular number of the arm; and thus our barrel, cylinder and etc, each with a quantity of his fellows, are taken away for their final finishing.

Most of the metal work is carried to the dry polishing shop—a room 60 feet square, located in the third story of the center building. Here it is polished on emery and other wheels, about half a yard in diameter, the operatives sitting at their work. After inspection, the barrels and cylinders are handed over for the blueing process—an operation that requires nicety and practical experience. The ovens for this, as well as for the casehardening—to which process all the iron work is submitted—as well as the forges for tempering the springs, etc, are located in the forge shop. From the polishers, the mountings go to the electroplaters—who occupy a room 25 by 40, in the basement of the office building, where they are plated with silver, and afterward burnished. The woodwork returns to the stock maker's shop—a room 60 by 80, in the third story of the center building. This is supplied with power saws, planes, morticing and shaping machines and as throughout the whole establishment, every means is



adopted for labor saving. The stock then comes back for varnishing and the final finishing.

On their final completion, all the parts are delivered to the general storekeeper's department, a room 60 feet wide by 190 feet long, situated in the second story of the central building, and extending over the rear parallel, All the hand tools and materials (except the more bulky kinds) are distributed to the workmen from this place; several clerks are required to parcel the goods out and keep the accounts; in fact, it is a store, in the largest sense of the term, and rather on the wholesale principle at that. On the reception of finished, full sets of the parts of the pistols, they are once more carried up to the assembling room; but this time to another corps of artisans. Guided by the numbers, they are once more assembled; and now, although each portion has associated with scores of its fellows and gone through many distinct operations in distant parts of the establishment, our particular pistol, number 138,565, is reassembled as first united, and the finished firearm is laid on a rack, ready for the prover; of course many others accompany it to the department of this official, which is located in the third story of the rear building. Here each chamber is loaded with the largest charge possible, and practically tested by firing—after which they are cleaned out by the prover and returned to the inspection department. The inspectors again take them apart, thoroughly clean and oil them; then they are for the last time put together and placed in a rack for the final inspection. The parts having been so thoroughly examined and tested, it would seem that this last inspection was scarcely necessary; but, after a short observation, we saw several laid aside. Taking up one with a small mark on the barrel, 'Why do you reject this?' we inquired. 'Pass that today, and probably much larger blemishes would appear tomorrow,' replied Mr T. The order from the Principal is perfection; and a small scratch in the blueing or varnish is sufficient to prevent the arm passing. The finished arm finally passing the inspection, is now returned to the storeroom—from whence, after being papered, they are sent to the wareroom, situated in the basement of the office building; from this they are sent to nearly every portion of the habitable globe.



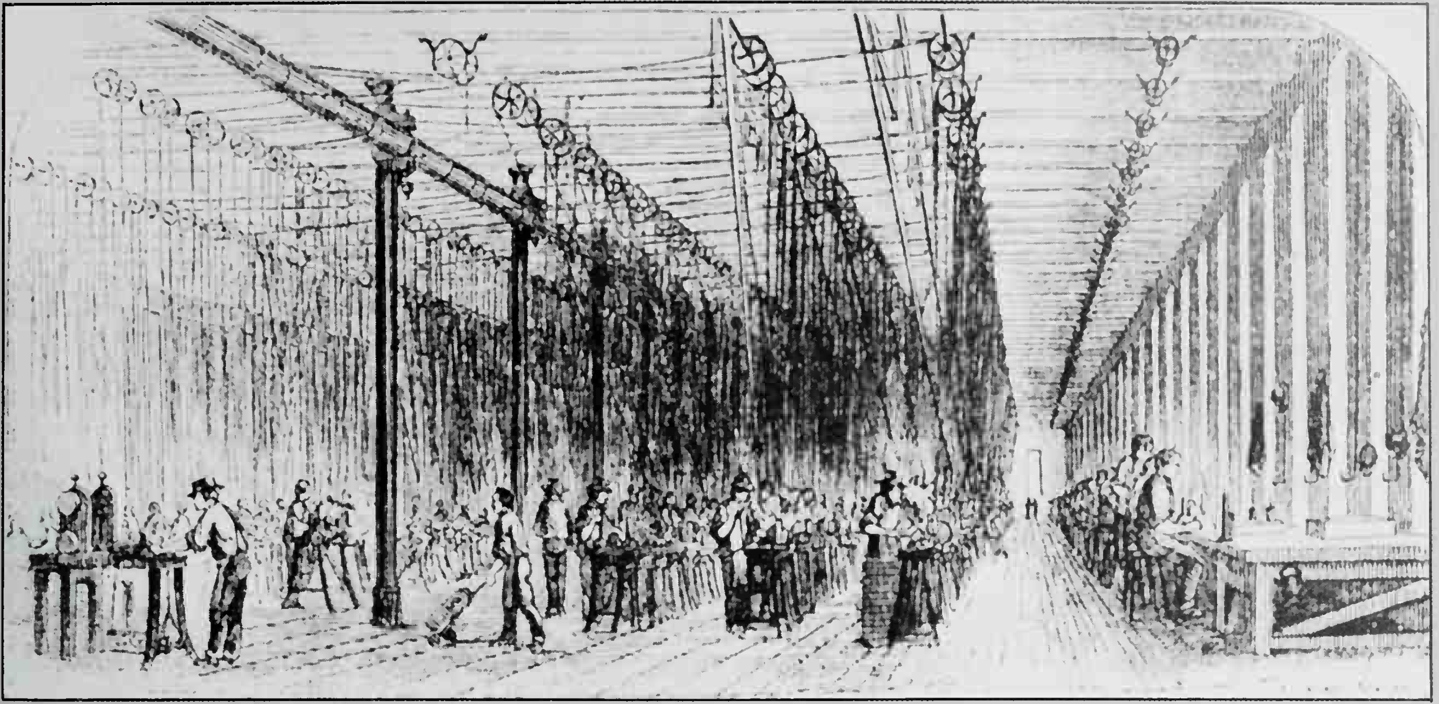
Besides the great degree of uniformity and precision arrived at by the adaption of machinery in this manufacture, which exactness could be compassed in no other manner, it is stated that a number sufficient to supply the present demand could not be produced by manual labor alone. During the time of our visit we were informed that scarcely less than 100,000 weapons were at that moment in the various stages of progress, yet the whole number of employee's was a little less than 600 who, by the aid of mechanical contrivances, turn out an average of 250 finished arms per diem.

In round numbers it might be stated that supposing the cost of an arm to be $100; of this the wages of those who attended to and passed the pieces through the machines was 10 percent, and those of the best class workmen engaged in assembling or putting together, finishing and ornamenting the weapons was also 10 percent, thus leaving 80 percent for the duty done by the machinery.

With the exception of the steam engine and boilers, a majority of the machinery was not only invented, but constructed on the premises. When this department was commenced, it was the intention of the company to manufacture solely for their own use. Some months since, applications were made by several foreign governments to be supplied with machines and the right to operate them. After mature deliberation, it was concluded to supply orders, and on the day of our visit we saw a complete set of machinery, for manufacturing firearms, that will shortly be shipped to a distant land. The company has now determined to incorporate this manufacture as a branch of their regular business.

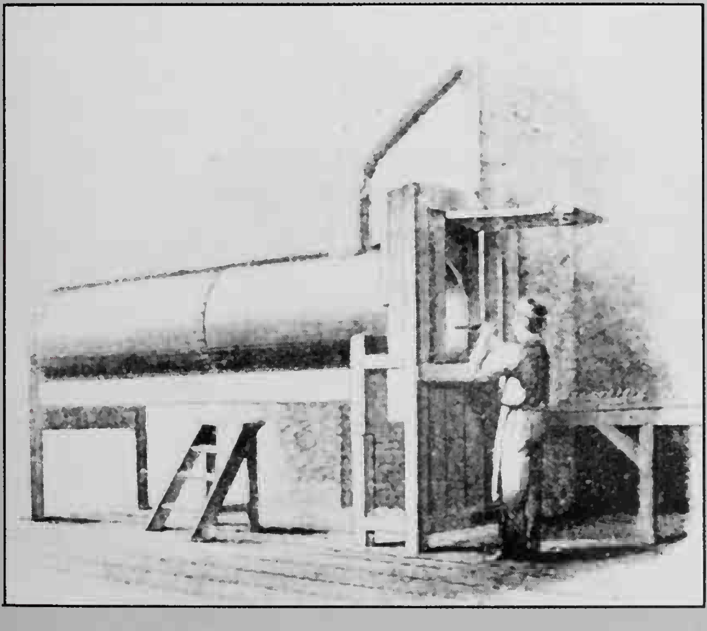
Employees' Welfare

Although so much care and attention have been exercised in perfecting the armory and its accessories and products, the general welfare of the employees has not been neglected; extensive arrangements for their comfort and convenience are in the course of rapid completion.



And we may here remark that they are deserving of such especial favor; as a body they are mostly young men, many of them having commenced their business life in the establishment. It was, in a measure, necessary to educate men expressly for the purpose, as the manipulation required is not exclusively that of the gunsmith, or of the machinist, but a combination of both of these callings. Taken as a whole, we found them decidedly a reading and thinking community, and we venture the assertion that it would be difficult to produce a counterpart of their mental capacity in the same number of mechanics employed in a manufactory. That they are well compensated for their services is evident from the fact of the payroll amounting to from $1000 to $1200 per day.

The grounds around the armory have been laid out in squares of 500 feet each by streets 60 feet wide; upon these squares are being erected commodious three-story dwellings. Sufficient for about 80 families have already been finished, and are occupied by the employees; the operations will be continued until all who desire are accommodated. These houses have all the conveniences of city life. Gasworks, of sufficient capacity to supply as large a population as can occupy the area, have already been erected and put into operation.



One of the buildings is a beautiful structure known as Charter Oak Hall—so named from its being located on the same avenue as the venerable and time-honored tree, which for centuries braved the storm, and from a singular incident became celebrated in our colonial history. This hall is employed by the operatives for lectures, debates, concerts, balls and etc. The festive occasions are enlivened with music from a band organized from their midst—the instruments, which are most excellent, having been furnished through the liberality of Colonel Colt. A public park, fountains and etc, are in the plans, all of which are being successfully executed.

On the hill overlooking the whole is the palatial residence of the proprietor. It is really a superb edifice, the main building being 50 by 100 feet; it is in the Italian villa style—the ground and outbuildings being on the scale which would naturally be expected of a man of his extended views and liberal taste.

—*United States Magazine* (March 1857)

The tour continues—*clockwise from immediate left:* The Proving Room, the Dry Polishing Room, machinery for stocks and grips, and the main part of the armory—a room that was ranked as the best, most well-arranged and efficient workshop of its time.

Metallic

The history of self-exploding metallic cartridges actually began in France about 1812, with a Monsieur Pauly. The first types of this ammunition were actually made of paper which held the powder and the bullet, and only the rear of the cartridge was brass, with its depression to hold a detonator. When the cartridge was fired, the paper holding the powder and bullet were consumed in the explosion. In later improvements in cartridges of this kind, the paper shells were discarded in favor of a rolled cardboard—somewhat similar to our modern shotgun shells.

In 1847 Monsieur Haulier patented the idea of a self-contained cartridge that employed copper and brass in its construction. These types of shells were of very small caliber, and the first metallic cartridge to come to the United States (in the mid-1850s) was an early .22 short. Once arriving in America, the metallic cartridge soon took on more standard forms of construction, and was also being made in larger calibers.

Of course, these cartridges are the mainstay of the firearms industry today, and the four key elements of their original construction are the four elements common to all cartridges presently. The first of these elements is the case, which is made out of expandable metal, which, even though it expands upon detonation, immediately contracts in size slightly, to allow removal from the chamber. The second element is, of course, the explosive material, a gunpowder of some sort, which is loaded into the case. The third element is the bullet or projectile, which is crimped or fitted into the case in some manner. And the fourth element is the primer, or explosive device, which, when the hammer strikes it, detonates the powder.

When metallic cartridges were first introduced in the mid-1800s, the primer was generally of a fulminate of mercury compound. The explosive was generally black powder, which produced great amounts of smoke and flame, and bullets were generally of pure lead.

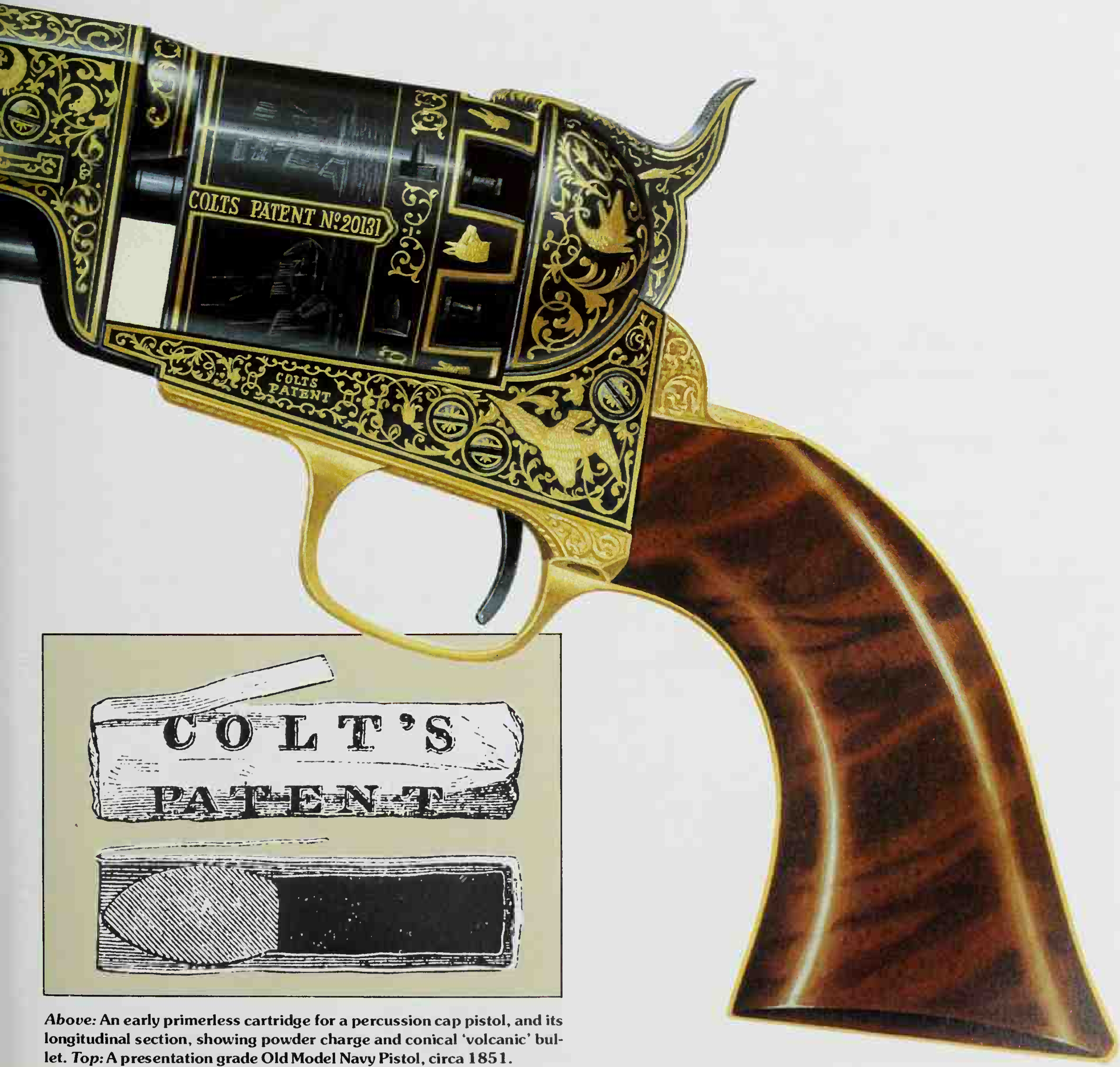
By the time of the Civil War, at least two repeating rifles, each employing metallic cartridges, were in use. They were the Henry rifle and the Spencer rifle. These two rifles were in .24 caliber and .56 caliber respectively.

It is interesting to note that the first metallic cartridges were of the 'folded head' type. Their distinguishing feature was that even though they were self contained, they could not be reloaded after they were fired. This proved to be quite a disadvantage, and naturally, other designs were brought forth, particularly by a Mr Bearden, who invented the 'boxer' type of center fire cartridge with a drawn brass case, which could be reloaded.

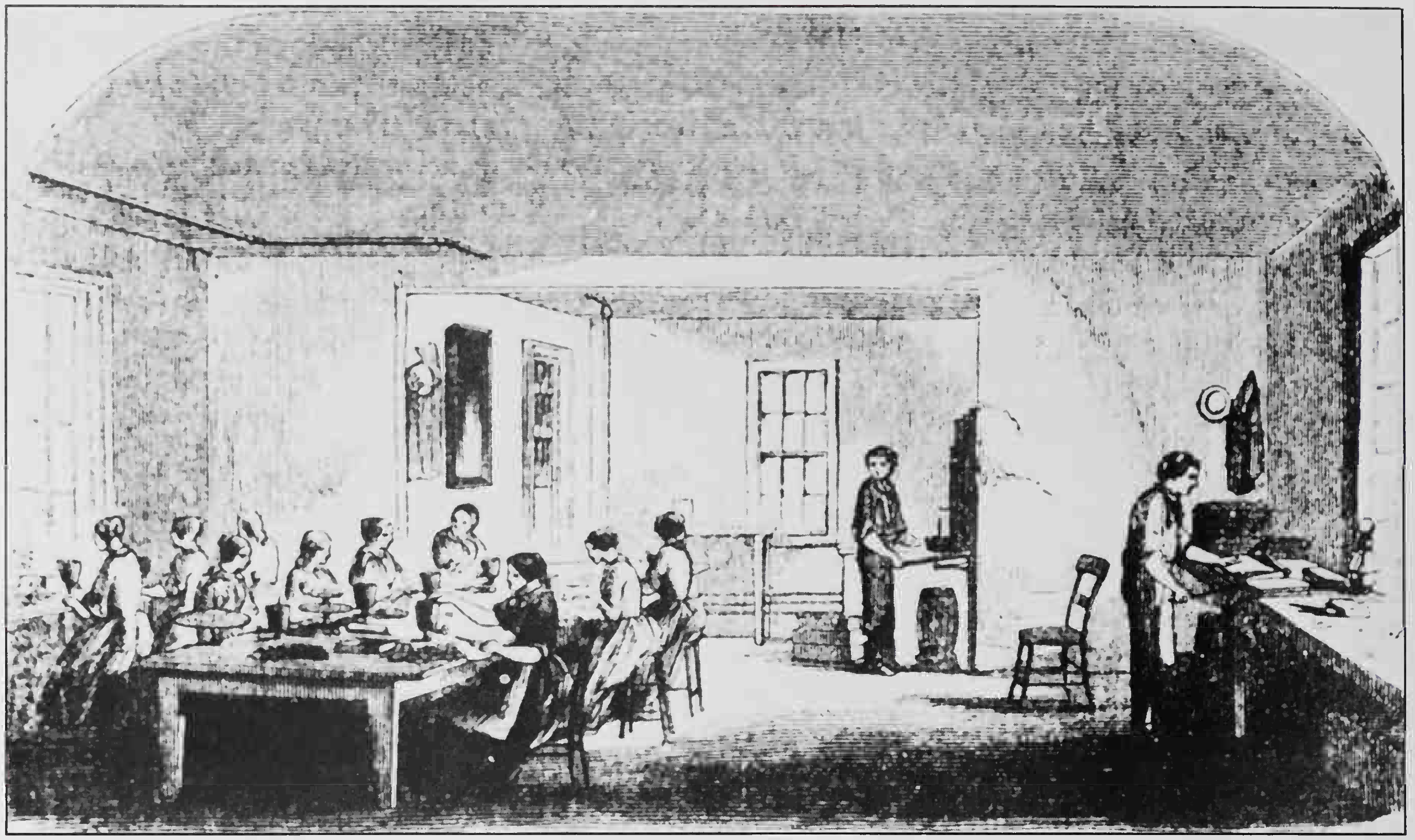
The ability of Bearden's case to withstand the blow of the hammer and retain its shape was of such tremendous advantage that Army regulations for many years called for soldiers to both save and reload their fired ammo cases.

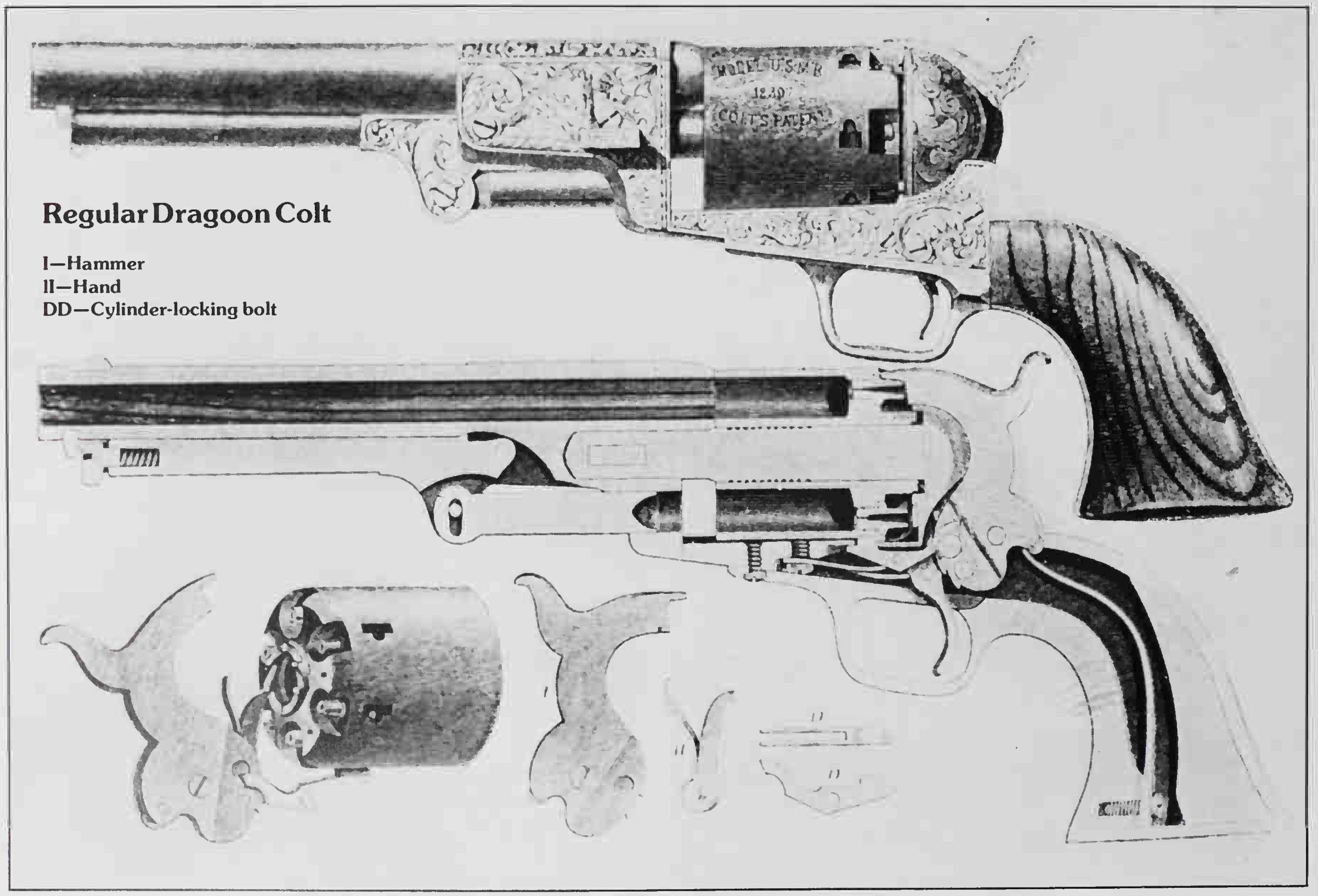
The metallic cartridge revolution was actually first seen in rifles, not pistols. But it was not long before the idea took shape to use these new cartridges in revolving cylinder handguns. But a particular legal entanglement over a certain patent by Rollin White prevented the use of center fire cartridges in revolving pistols for some years. White had taken out a patent which involved the loading of shot and the recapping of primers from the rear of the cylinder. This concept was later adapted into a rimfire .22 caliber pistol. This particular pistol was never a commercial success, but

Cartridges


COLTS PATENT N°20131
COLTS PATENT
COLT'S
PATENT

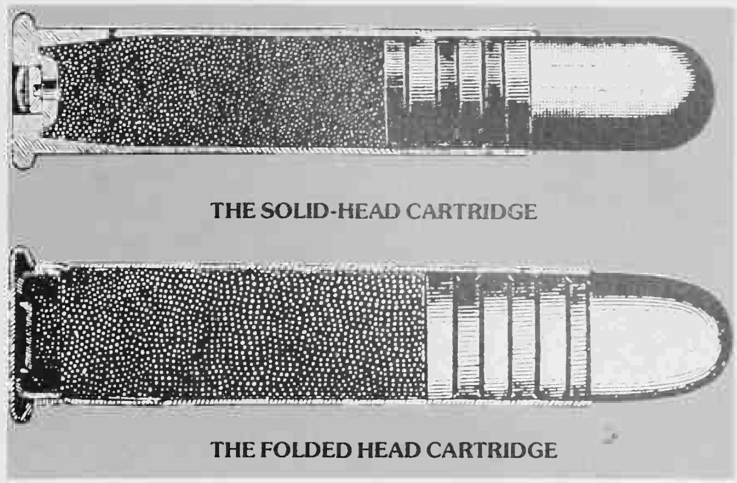
Above: An early primerless cartridge for a percussion cap pistol, and its longitudinal section, showing powder charge and conical 'volcanic' bullet. *Top:* A presentation grade Old Model Navy Pistol, circa 1851.




Regular Dragoon Colt
I—Hammer
II—Hand
DD—Cylinder-locking bolt

Above: A section drawing of a Regular Dragoon Colt, a typical Colt design from 1847 to 1855. *Top:* Colt primerless cartridges were made here; these cartridges predated the revolutionary metallic cartridge.

Above opposite: **A folded-head cartridge, the first satisfactory metallic center-fire cartridge in use; a modern, solid-head cartridge.** ***Opposite:*** **Colt's first metallic cartridge revolver, the Single Action Army.**



THE SOLID-HEAD CARTRIDGE

THE FOLDED HEAD CARTRIDGE

the ideas behind it were patented, and were therefore unavailable to other arms manufacturers—at least while the patent stood.

Another factor that prevented the quick conversion from cap and ball to cartridges was the fact that cartridges were not widely produced, and were therefore not readily available to the public. But the advantages of cartridges were overwhelming, and where there was a will, a way would be found. The great conversion from cap and ball to cartridges was underway. It would take many turns, but in the end cartridges would win out.

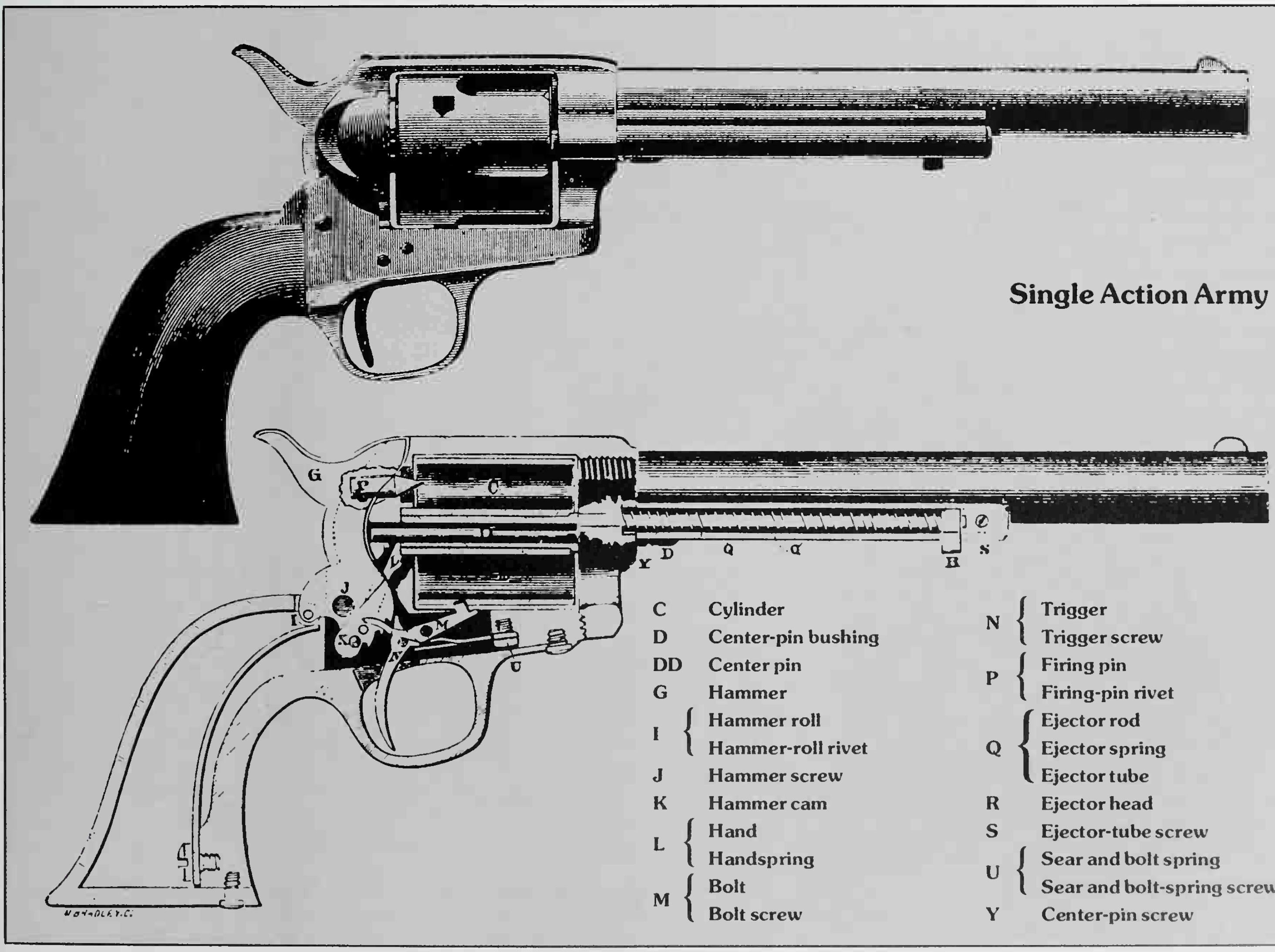
Because the cartridge revolution had first taken place in rifles and long arms, naturally, gun owners wanted to convert their cap and ball pistols to be able to use the same cartridges as their long arms. Since most of the long arms which used cartridges were of .44 caliber, it was natural that the first pistols were of .44 and .45 caliber, also.

Actually, the conversion of a cap and ball pistol into a cartridge pistol was relatively simple. The nipples, which held the caps in place, were simply cut away, leaving an open hole in the rear of the cylinder, large enough to accommodate the cartridge. The hammer was then modified such that when it was released, the primer at the rear of the cartridge was struck forcibly enough to set off the powder. Of course the rammer—which was indispensable for the loading of a cap and ball pistol—was no longer needed, and was usually removed as a part of the conversion process.

But centerfire cartridges were still hard to obtain, and so many folks of the time took to carrying two separate cylinders with them. One of the percussion cap type, and the other of the new cartridge type.

Later, another alteration of importance took place. This was Mr Thuer's patent which was taken out in 1868. It incorporated small firing pins in the cylinder itself—thus negating the need to alter the cap and ball hammer.

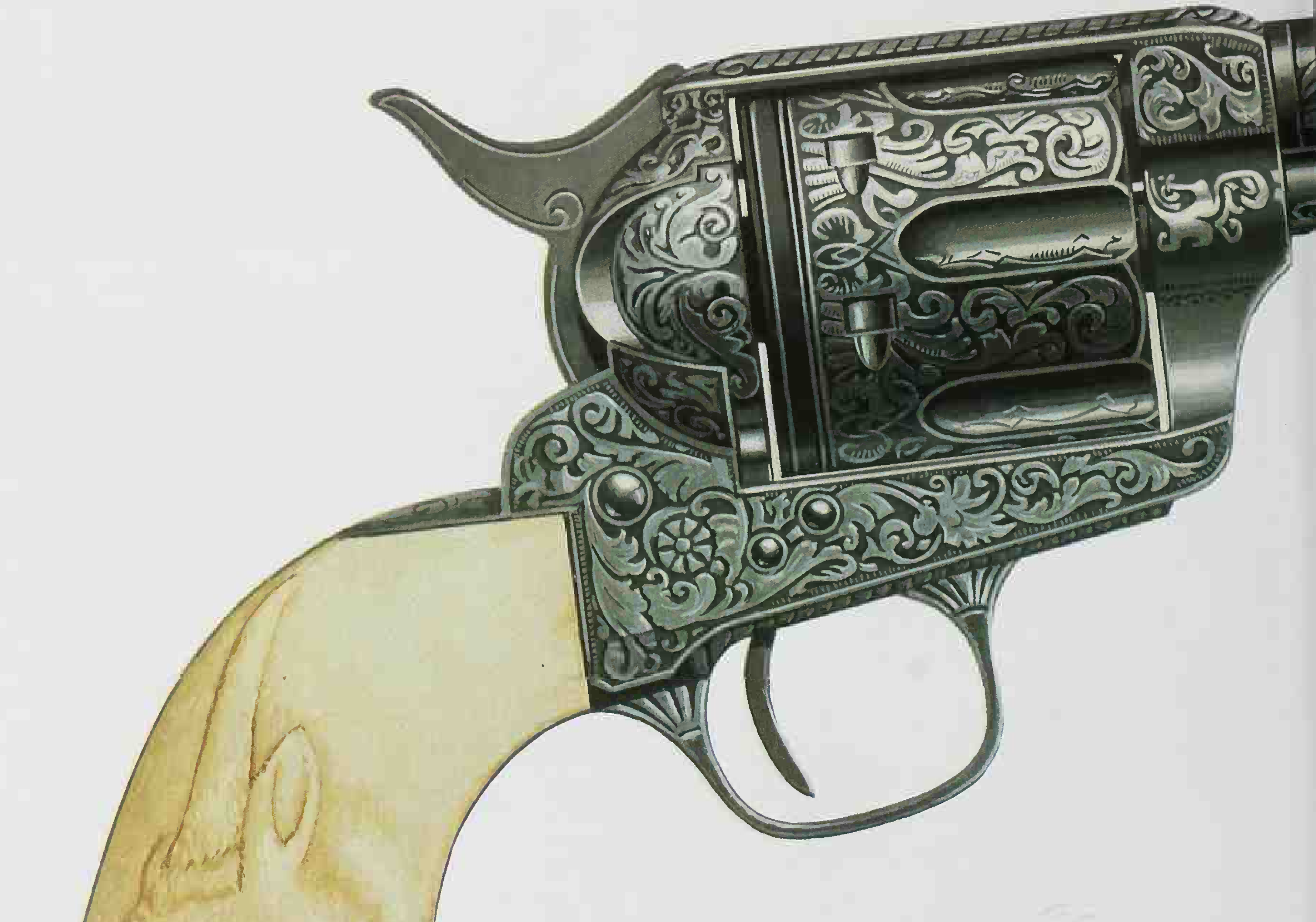
As can be seen from the above, this alteration process from cap and ball to cartridges was momentous enough to generate its own set of patents. The alteration process itself made money for the gunmakers as well. Colt accepted contracts with the government for alterations of all revolvers in the hands of all of the Armed Services of the United States Government in 1872.



Single Action Army

C	Cylinder
D	Center-pin bushing
DD	Center pin
G	Hammer
I	Hammer roll Hammer-roll rivet
J	Hammer screw
K	Hammer cam
L	Hand Handspring
M	Bolt Bolt screw
N	Trigger Trigger screw
P	Firing pin Firing-pin rivet
Q	Ejector rod Ejector spring Ejector tube
R	Ejector head
S	Ejector-tube screw
U	Sear and bolt spring Sear and bolt-spring screw
Y	Center-pin screw

Great Colts Nineteenth



Above: An ornate example of the Colt Single Action Army Target Model, which is basically the same—aside from its 7.5 inch barrel—as the famous Colt 'Peacemaker' Frontier Model Single Action Army Revolver.

# of the Century

The 'Peacemaker,' The Gun that Won the West

The Peacemaker was the first cartridge pistol produced by the Colt Company. It was first officially known as the New Model Army Metallic Cartridge Revolving Pistol, and later renamed Single Action Army Revolver.

This weapon was a .45 caliber pistol using the new self-contained center-fire cartridges. Up to 40 grains of black powder could be packed behind its 235 grain lead bullet. But the government initially chose to pack only 28 grains of black powder instead of the maximum 40.

The Single Action Army Revolver was initially produced in 1871, and by 1873, the first order of 8000 was placed by the Army's Ordnance Department. There were basically three barrel lengths available for the Single Action Army Revolver, and these were representative of the three basic markets employing such a weapon. The Cavalry Model had a barrel length of 7.5 inches. This was to facilitate long-range accuracy. The standard or Artillery Model had a barrel length of 5.5 inches. And for civilians, a 4.75 inch barrel model was made available.

Since the availability of cartridges was somewhat limited on the frontiers, and since most customers carried both a sidearm as well as a rifle, the Single Action Army was quickly tooled to use .44-40 caliber ammunition, so as to match the caliber of the very popular 1873 Winchester Repeating Rifle. This was not simply a matter of convenience to frontiersmen. The ability to have both of one's firearms chambered for the same cartridge could mean the difference between life and death in certain situations.

There is a particular type of Single Action Army Pistol called the Buntline Special, which has caused some confusion among historians. The Buntline Special got its name, not from anyone at the Colt factory, but rather from a Ned Buntline, who was a prolific writer of the period. Buntline specialized in writing about the Wild West. On trips into the West, he presented various distinguished frontiersmen with Army Colts with 12-inch barrels and shoulder stocks. Wyatt Earp and Bat Masterson were among those to receive such weapons. It is doubtful, however, that there was much practically to pistols with foot-long barrels. They were mainly for gift and show purposes. Obviously, Buntline found it more sensational to write about characters shooting it out in the streets of the Wild West with pistols of extraordinary barrel length rather than more conventional arms.

The Single Action Army Pistol provided the overall pattern for 'six-shooter' type Colt pistols up to the present time. It is the gun that is the most easily recognized as being a Colt by the general public, and indeed its appearance is deeply etched into the American psyche. The Single Action Army became the Frontier Colt. It was the 'Peacemaker' that stood between the law abiding and the outlaws. Wild Bill Hickok and Wyatt Earp (the first marshall of Dodge City, then Wichita, Kansas—and finally Tombstone, Arizona), used their Colts to blaze their way into the history of the Wild West. And of course, desperados and anti-heros had them also. William Bonney, alias Billy the Kid, did his murderous work with Colts. Even the brash and wily General George Armstrong Custer vainly relied on his Single Action Armys when justice was done at the battle of the Little Big Horn.

Legend has it that the renown of the Old Frontier Six-Shooter was such that it was 'not God or the Declaration of Independence that made men free and equal, but, rather,

Left: **General George Custer was known for his pair of fancy Colts.** ***Above:*** **Early cowboy movie star William S Hart brandishes his Peacemakers.** ***Right:*** **Patent drawings for the Peacemaker show metallic cartridges in its chambers, and how its chambers align with its barrel.**

Mr Samuel Colt.' Another legend runs that on a tombstone is inscribed the words 'Here lies poor Bill Adams, he was shot with a Colt Revolver, and of such is the Kingdom of Heaven,' leaving one to wonder whether the realms above are inhabited by men, or pistols—or hopefully a happy combination of both.

When their lives depended on it, men and women depended on their Colt revolver. In the movie *The Shootist*, John Wayne explains to a young boy that to survive a gunfight is not so much a matter of speed and accuracy as it is a matter of being 'willing.' And when men had to rely upon their 'willingness,' they found their Colts to be equally as willing and reliable.

Other Great Revolvers

In the years after the Civil War, the nation was expanding westward, the South was rebuilding, and the overall tenor of the times was one of flux and change, expansion and competition. In this atmosphere, a greater and greater need arose for personal protection. The National Arms Company had begun to produce small, single shot Deringer Pistols in the early 1870s. The Colt Company bought out the National Arms Company, and in so doing, inherited the Deringer line of small handguns. While the general public's concept of a Deringer-type pistol is that the weapon is of small caliber, the original Deringers were actually of .41 caliber, and thus packed quite a punch.

The first center fire pistols to appear on the market were all of single action variety. This meant that the hammer had to be cocked, thus revolving the cylinder before the trigger could be pulled. In the later 1870s, Colt introduced its new Double Action Self-Cocking Center Fire Six-Shot Revolver. The revolving of the cylinder into place was no longer dependent on the cocking of the hammer, but was rather now a function of the pulling of the trigger. When the trigger was pulled, the cylinder would almost instantaneously roll into place, and the hammer would miraculously pull itself into a cocked position and immediately would snap forward, firing the cartridge. This meant that all six shots in the cylinder could be fired as rapidly as the trigger could be pulled. Here was advancement indeed! Colt referred to this first double action pistol as the Lightning Model.

However, this first double action revolver did not meet with as much success as might have been anticipated. The number of internal parts required to produce such lightning speed was greatly increased, thus contributing to the overall weight and complexity of the weapon. Many continued to use their far more simple single action 'Peacemakers.'

By the early 1900s, however, the transition from single action to double action weapons was almost complete. An interesting variation on the double action revolver took

W. MASON.

Revolving Fire-Arms.

No. 158,957.

Patented Jan. 19, 1875.

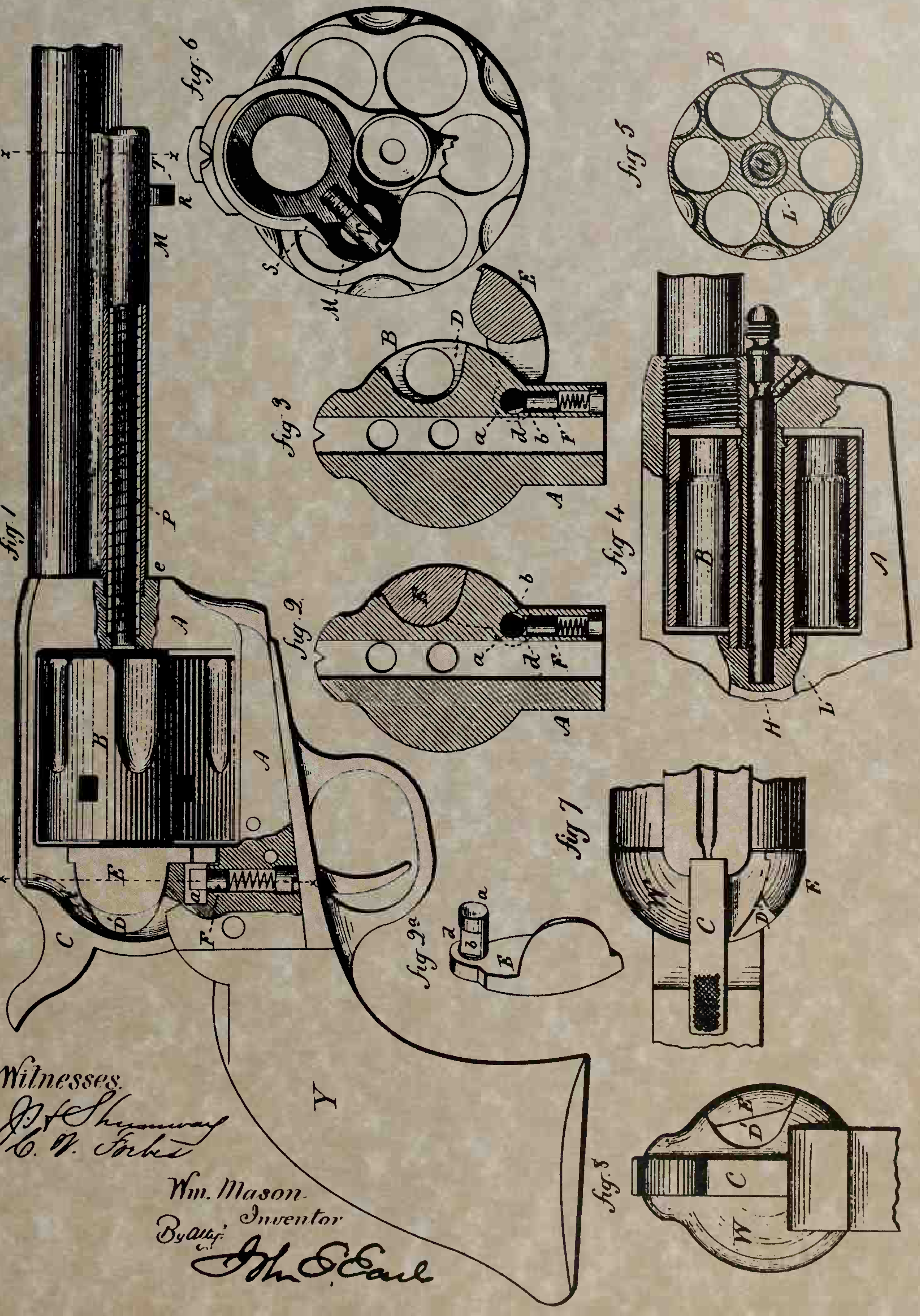
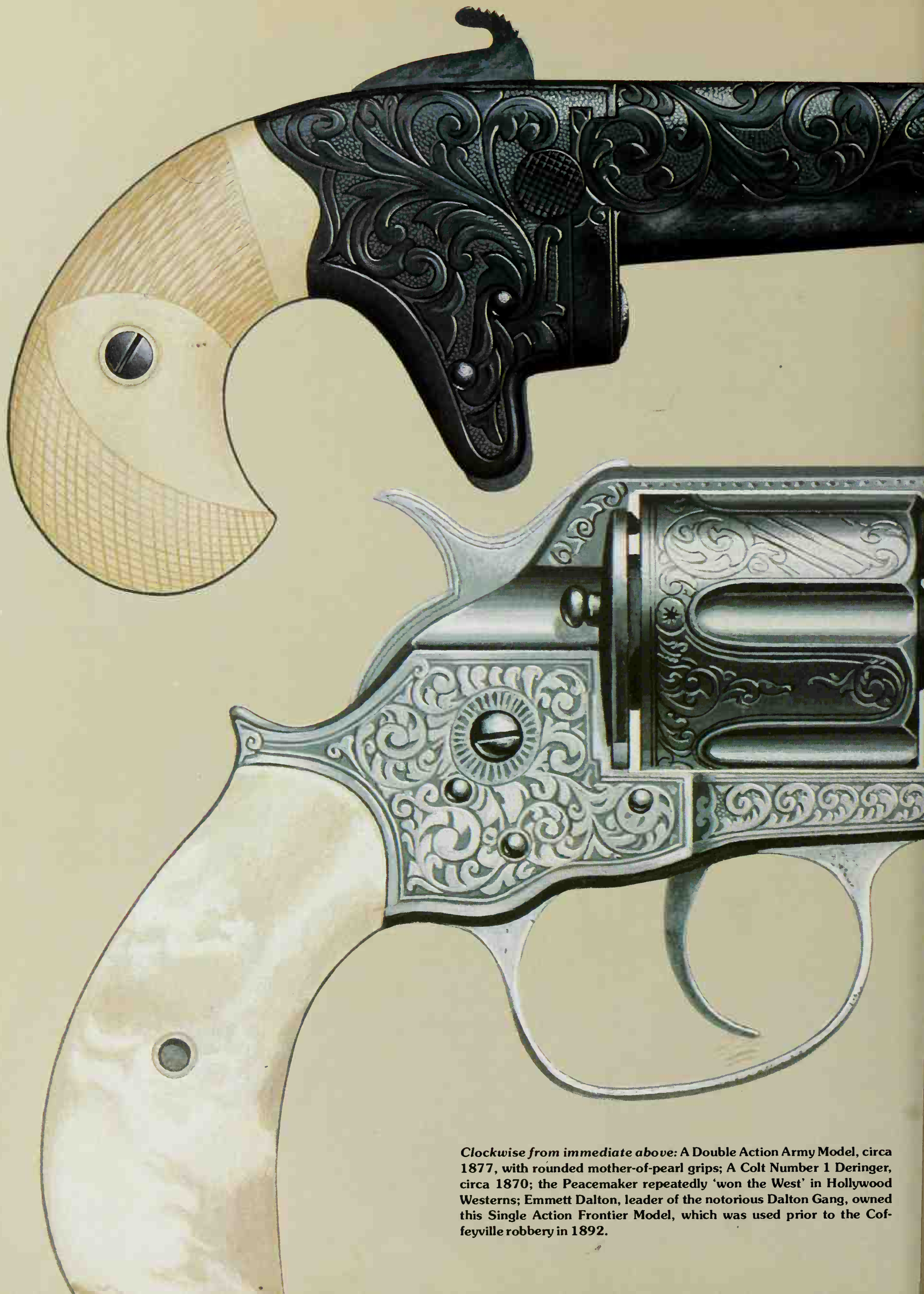


fig. 1
fig. 2
fig. 2a
fig. 3
fig 4
fig 5
fig. 6
fig 7
fig. 8
A
B
C
D
E
F
H
L
M
P
R
S
T
W
Y
a
b
d
e
x
z

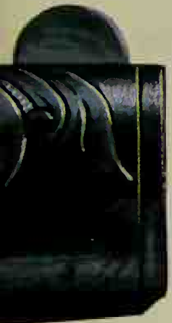
Witnesses.
J. F. Shumway
C. V. Forbes

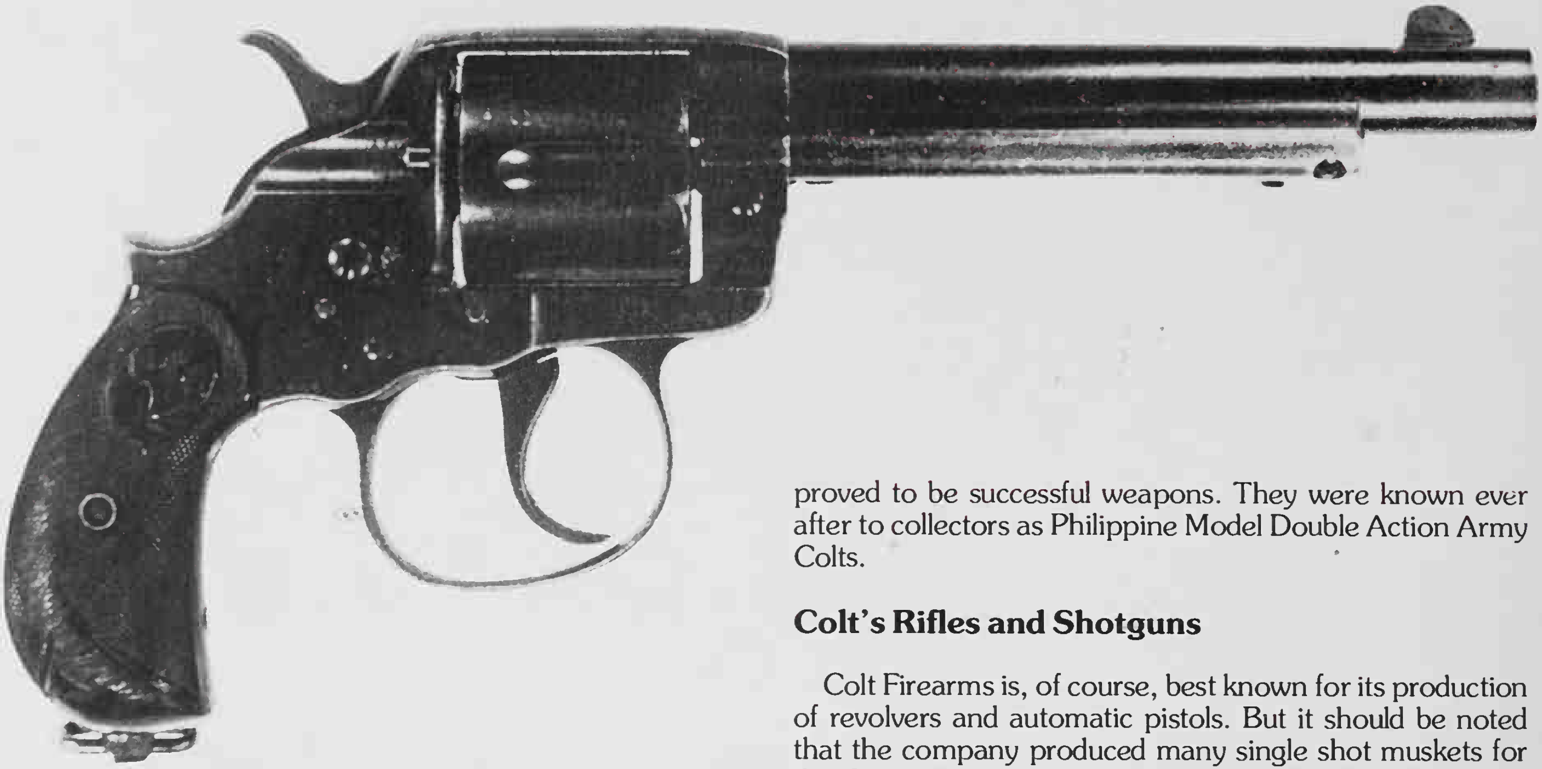
Wm. Mason
Inventor
By atty.
John E. Earl

THE GRAPHIC CO. PHOTO-LITH 39 & 41 PARK PLACE N.Y.



Clockwise from immediate above: A Double Action Army Model, circa 1877, with rounded mother-of-pearl grips; A Colt Number 1 Deringer, circa 1870; the Peacemaker repeatedly 'won the West' in Hollywood Westerns; Emmett Dalton, leader of the notorious Dalton Gang, owned this Single Action Frontier Model, which was used prior to the Coffeyville robbery in 1892.





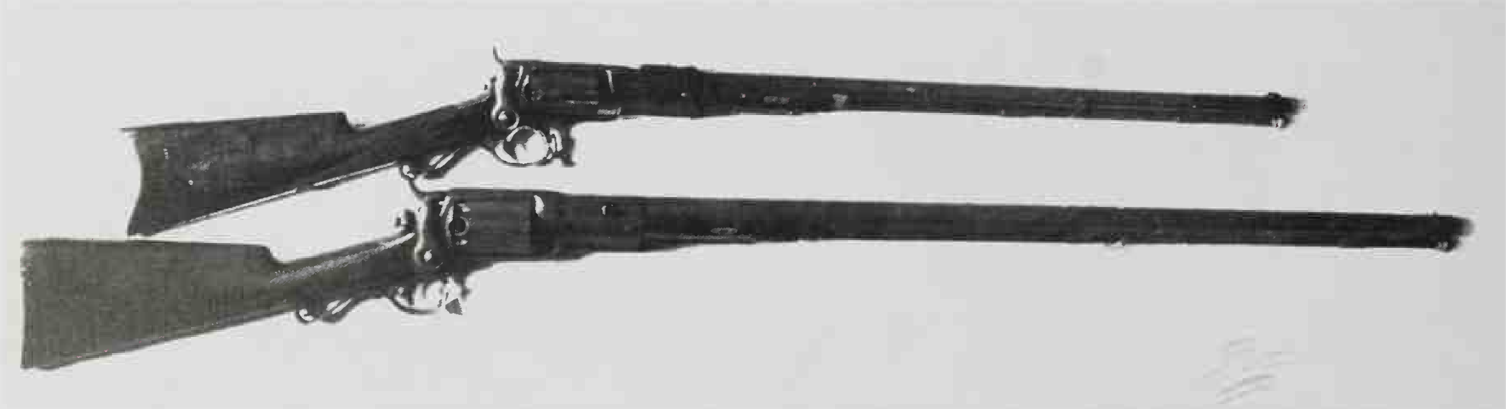
place in 1902. The government had contracted with Colt to produce some double action army models with wider triggers and enlarged trigger guards. Ostensibly, these weapons were to be used in Alaska, and the customized alterations were such that troops could more easily use the pistols in very severe weather where heavy gloves were required. These pistols originally bound for Alaska were of the .45 caliber variety. At the same time, American troops were engaging foes in the Philippine Islands, half a world away. The standard issue weapon in the Philippines at that time was .38 caliber Double Action Army Pistols. These were found, by experience, not to pack the firepower needed to successfully engage the enemies in deep jungle surroundings. So, in typical Army fashion, the Alaska-customized Colts were sent to the Philippines because of their larger caliber, and proved to be successful weapons. They were known ever after to collectors as Philippine Model Double Action Army Colts.

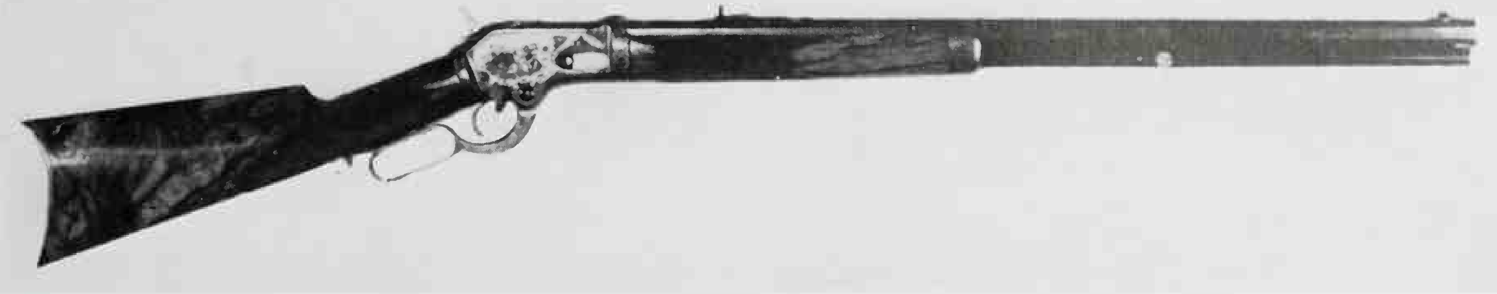
Colt's Rifles and Shotguns

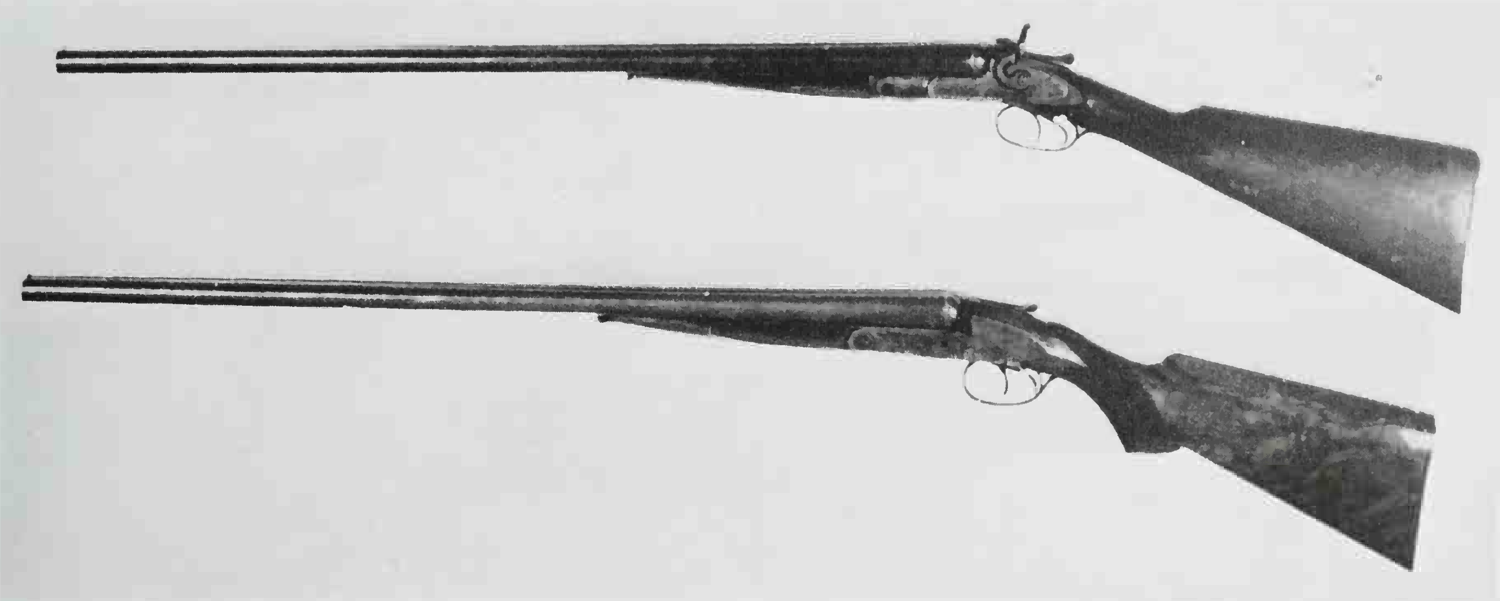
Colt Firearms is, of course, best known for its production of revolvers and automatic pistols. But it should be noted that the company produced many single shot muskets for the Civil War, and between that time and the early 1900s, produced many different kinds of rifles and shotguns in both single and double-barreled varieties. A General Berdan of the US Army had patented a particular kind of bottlenecked center fire cartridge in the 1860s. The Colt Company built a rifle around this cartridge design known as the Berdan Russian Rifle. In 1870, the Russian Government contracted for the construction of 40,000 of these single shot, breech loading rifles.

In the later 1870s, Colt even produced both hammered and hammerless double-barreled shotguns, but both models were discontinued by 1900.

This business of placing two barrels side by side was, at first, thought to be a profitable idea. In about 1880, Colt produced a .45-70 double-barreled rifle. But the model soon fell into disfavor with the public and was discontinued, probably due to its excessive weight. Winchester had cap-



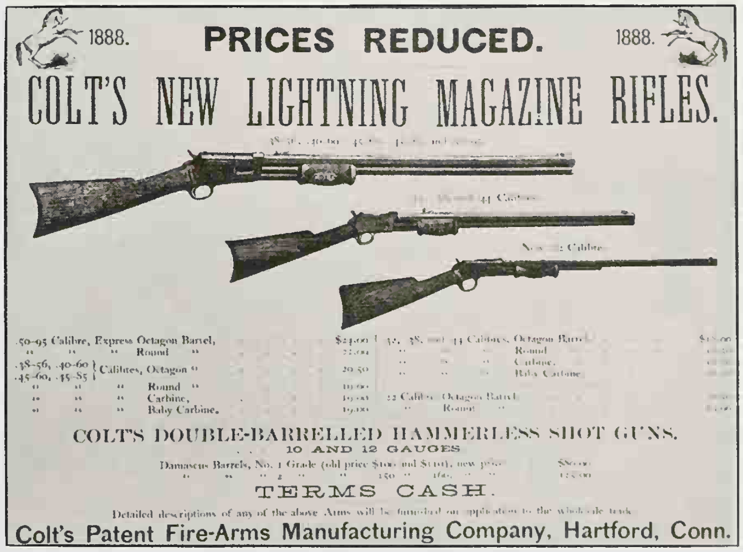




tured the market in rifles and carbines with their .44-40 caliber weapons. Colt attempted to capitalize on this popularity by bringing out, in 1883, the first Colt repeating rifle using the new cartridge ammunition. It was produced in both the shorter carbine size, as well as the longer rifle size, but only a little over 6000 specimens were produced.

In the mid-1880's, an altogether new type of repeating rifle appeared. It was known as the 'Lightning Magazine Rifle.' It was produced under a Dr Elliot's patents. It incorporated a 'trombone' action, which we know today to be the familiar 'pump' or 'slide action.' The old spent cartridge was ejected from the chamber, and a new one was mechanically inserted into place by the quick sliding action of the hand on a rail mounted parallel to the barrel. This allowed the user of the 'Colt Lightning Pump' to hold the rifle's trigger and work the slide, thus achieving a near-machine gun rate of fire. In some quarters, the Colt Lightning Pump is said to be 'the gun that *should have* won the West.'

But by the early 1900s, profitability was not to be found in the production of sporting arms, but, rather, in the manufacture of the new automatic pistols, rifles and mounted military weapons.



1888. **PRICES REDUCED.** 1888.

COLT'S NEW LIGHTNING MAGAZINE RIFLES.

COLT'S DOUBLE-BARRELLED HAMMERLESS SHOT GUNS.

10 AND 12 GAUGES

TERMS CASH.

Colt's Patent Fire-Arms Manufacturing Company, Hartford, Conn.

***Clockwise from immediately above:* An early ad for Colt's Lightning Pumps; a Lightning Express .44-40 model; a Colt Berdan rifle for the Russian Army; Colt 1855 model revolving sidehammer shotgun (five shots) and rifle (six shots); Colt Phillipine model pistol; Colt's lever action 'Burgess' rifle; and Colt hammer and hammerless shotguns.**

The Evolution
Modern Colt

The modern era of Colt revolvers can actually be traced to the early 1890s, when Colt scored a resounding market victory over its competitors by introducing 'swingout' cylinders on its double-action revolvers. Prior to this time, many single and double-action revolvers had to be broken between the breech and the cylinder in order for the cartridges to be loaded. This placed the pistol in an inverted 'V' position in the user's hand. Alternately, many Colt revolvers had a 'reloading notch' offset at the rear of the cylinder. Shells were placed in their chambers by rotating the cylinder until an empty chamber aligned with the reloading notch, at which point the shell was manually loaded into the chamber. The rotating procedure was followed for unloading spent shells, with the exception that, at this point, the 'empties' were pushed out of their chambers with the famous offset ejector rod, which gave the Peacemaker its distinctive head-on appearance. But now the cylinder had only to be released from the overall frame and swung out on hinges in a sideways motion in order to facilitate unloading and loading. Colt was about 10 years ahead of its competitors at Smith and Wesson in this new innovation, and profited immensely by it.

The modern era of Colt Revolvers, at least, began with the Official Police Model, which went by the name of New Navy when it was first introduced in 1889. Variations on this basic model continued in subsequent years. The Pocket Positive, the Police Positive, and the New Service Revolvers are among the most famous of these early truly modern revolvers.

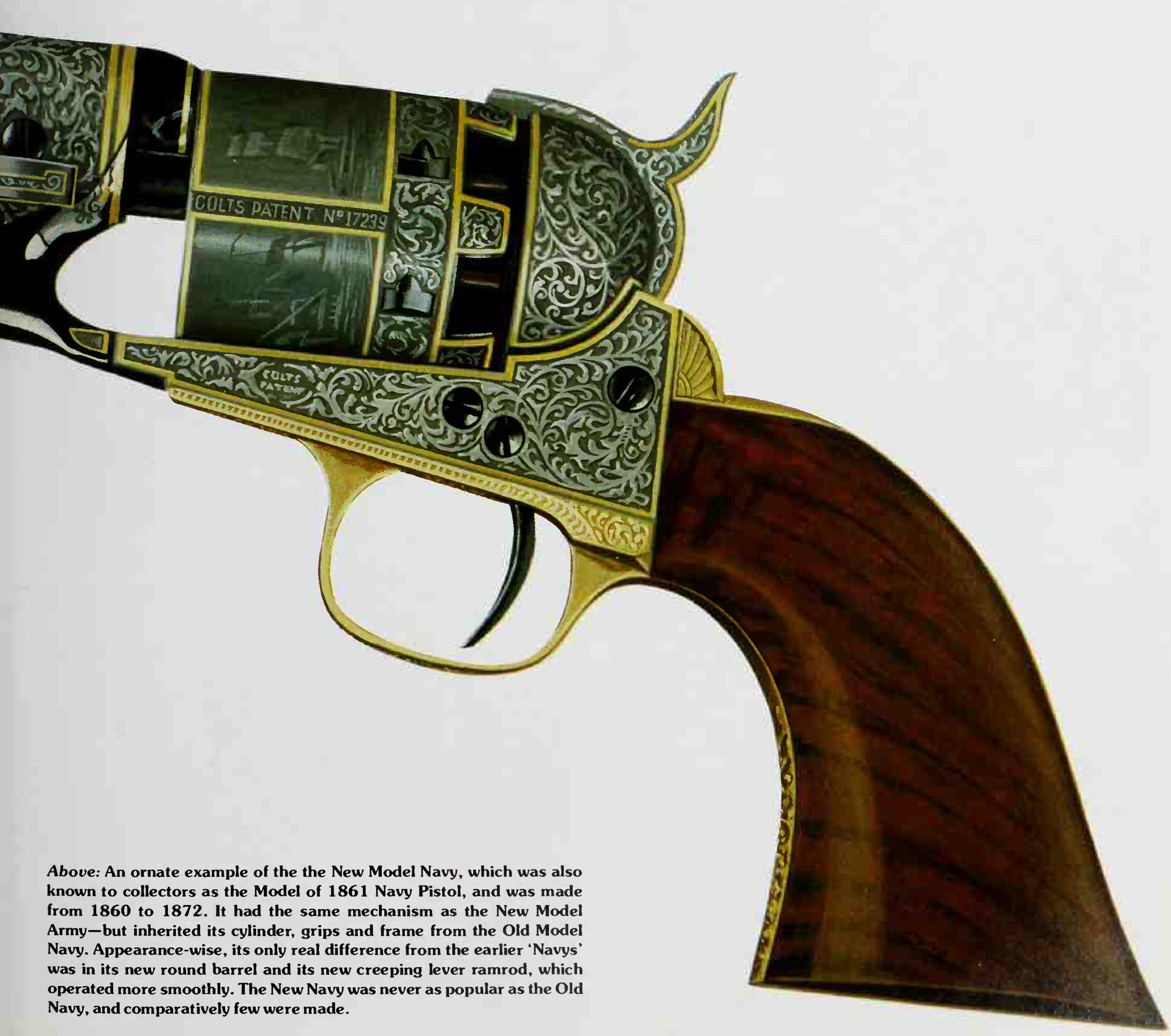
In the 1930s, target shooting became popular to the extent that target type pistols were designed from regular production models. This began a trend that continues to the present day. The features incorporated into a target weapon are usually more advanced than those generally found in common production weapons. In time, these advanced features 'trickle down' into the regular production firearms.

This phenomenon of a shifting awareness that pistols could be used for long range target shooting with great accuracy, and not merely for short range work, and the gradual inclusion of target model features into standard off-the-shelf pistols has laid the foundation for constant improvements in Colt firearms—particularly the revolver series—since the turn of the century.

The history of Colt revolvers from the early 1900s until the mid 1950s is basically a picture of several different models, basically similar to one another, being produced in very large quantities and providing the collectors with an almost insurmountable task of tracing, cataloguing, and documenting this body of firearms. The four standard means of differentiating these different models from one another are noting the size and type of hammer employed, the type of sights, the kind and size of grips, and the barrel and chamber dimensions.

Even employing these methods, the task of documenting different models is sometimes overwhelming. As an ex-

# of the Revolver



Above: An ornate example of the the New Model Navy, which was also known to collectors as the Model of 1861 Navy Pistol, and was made from 1860 to 1872. It had the same mechanism as the New Model Army—but inherited its cylinder, grips and frame from the Old Model Navy. Appearance-wise, its only real difference from the earlier 'Navys' was in its new round barrel and its new creeping lever ramrod, which operated more smoothly. The New Navy was never as popular as the Old Navy, and comparatively few were made.

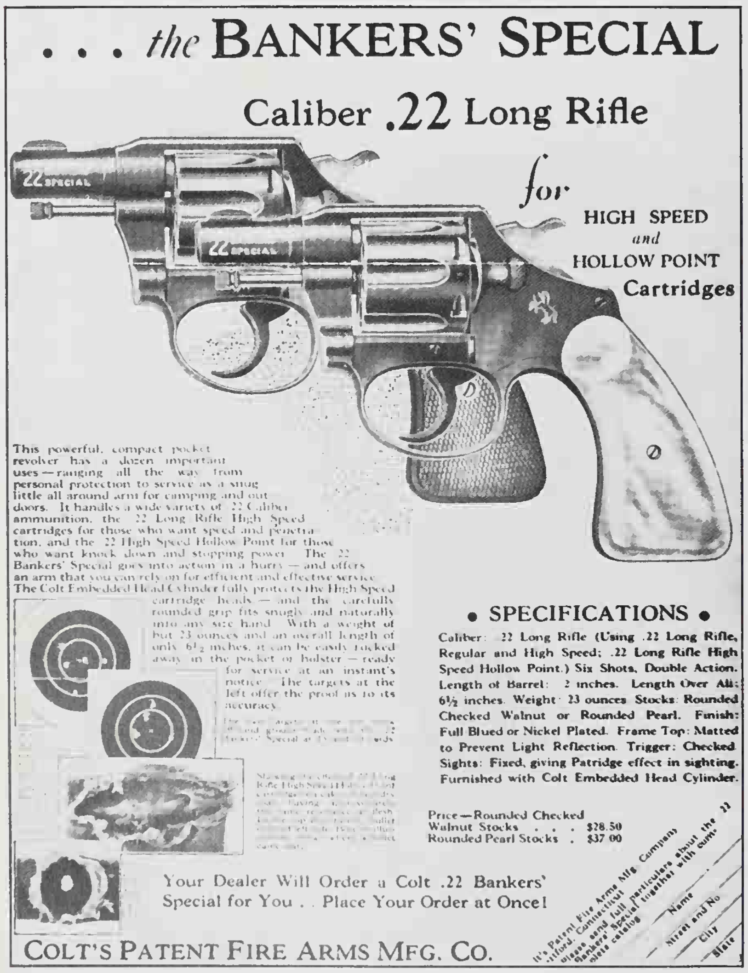
ample, the New Service Double Action Revolvers were introduced in 1898. Between then and the middle 1940s, when the model was discontinued, over 350,000 were produced. There were so many serial number runs employed during this time that a collector could specialize in only these New Service Pistols, and probably never be able to acquire a representative specimen of each of the conformations.

It was also during this era that the modern 'snubnosed' pistols gained prominence. In 1837 Samuel Colt had introduced what collectors have since referred to as a 'Baby Paterson Pistol.' It had not proven to be very popular since concealable weapons at that period of American history were not of great importance. But in the 1920s, two snubnosed pistols were introduced into the market place—both of .38 caliber and varying only in barrel lengths. These were the 'Detective Special' and the 'Banker's Special.' Over 400,000 of these particular models have been produced to the present time.

In 1955, the Colt Python came into the hands of eager enthusiasts. This pistol was, and continues to be, the top of Colt's line of revolvers. It is, in the minds of many, without doubt the finest production revolver money can buy. It is available with various grips, triggers, hammers and sights. It is the 'issue weapon' of many police departments around the country. The Python has been the recipient of a veritable galaxy of awards and world records. Every Python, even though produced on an assembly-line basis, both is hand fitted and features the hand honing of all interior and exterior contact points. Pythons feature ventilated ribs, for greater heat dispersion in the barrel, a fast-cocking wide spur hammer and a fully shrouded ejecter rod. The .357 Magnum Python uses both .357 Magnum and .38 Special amunition. The Python features a 'locking hand' which secures the cylinder firmly into place when firing—no other double action revolver of any make incorporates this particular feature.

Up until the Python's introduction, the Officers Model .38 Special had been the premier Colt revolver. It had won numerous NRA center-fire pistol championships. These Officers Models were generally customized privately by

Counterclockwise from immediate below: **A 1933 advertisement for the Colt Bankers' Special; two pages from the 1940 Colt catalogue—the New Service Revolver was claimed to be able to stop 'any animal on the American Continent'; the Colt Python, Colt's top of the line revolver, was made available to the general public in 1955.**



. . . *the* BANKERS' SPECIAL

Caliber .22 Long Rifle

for

HIGH SPEED
and
HOLLOW POINT
Cartridges

This powerful, compact pocket revolver has a dozen important uses—ranging all the way from **personal** protection to service as a snug **little** all around arm for camping and out **doors**. It handles a wide variety of .22 Caliber **ammunition**, the .22 Long Rifle High Speed **cartridges** for those who want speed and penetration, and the .22 High Speed Hollow Point for those **who** want knock down and stopping power. The .22 **Bankers'** Special goes into action in a hurry — and offers **an arm** that you can rely on for efficient and effective service. **The** Colt Embedded Head Cylinder fully protects the High Speed cartridge heads — and the carefully rounded grip fits snugly and naturally into any size hand. With a weight of but 23 ounces and an overall length of only 6½ inches, it can be easily tucked away in the pocket or holster — ready for service at an instant's notice. The targets at the left offer the proof as to its accuracy.

• SPECIFICATIONS •

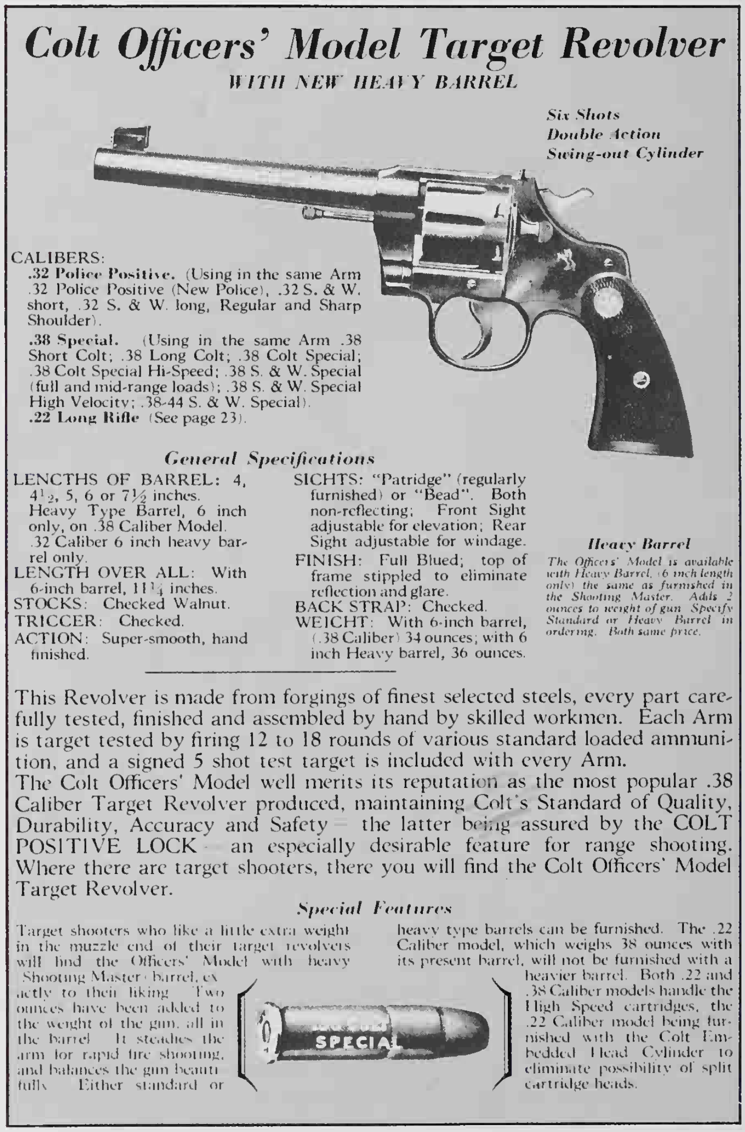
Caliber: .22 Long Rifle (Using .22 Long Rifle, Regular and High Speed; .22 Long Rifle High Speed Hollow Point.) Six Shots, Double Action. Length of Barrel: 2 inches. Length Over All: 6½ inches. Weight: 23 ounces. Stocks: Rounded Checked Walnut or Rounded Pearl. Finish: Full Blued or Nickel Plated. Frame Top: Matted to Prevent Light Reflection. Trigger: Checked. Sights: Fixed, giving Patridge effect in sighting. Furnished with Colt Embedded Head Cylinder.

Price—Rounded Checked	
Walnut Stocks	$28.50
Rounded Pearl Stocks .	$37.00

Your Dealer Will Order a Colt .22 Bankers' Special for You . . Place Your Order at Once!

COLT'S PATENT FIRE ARMS MFG. CO.

Colt's Patent Fire Arms Mfg. Company
Hartford, Connecticut
Please send full particulars about the .22 Bankers' Special together with complete catalog
Name
Street and No.
City
State



Colt Officers' Model Target Revolver

WITH NEW HEAVY BARREL

Six Shots
Double Action
Swing-out Cylinder

CALIBERS:
- **.32 Police Positive.** (Using in the same Arm .32 Police Positive (New Police), .32 S. & W. short, .32 S. & W. long, Regular and Sharp Shoulder).
- **.38 Special.** (Using in the same Arm .38 Short Colt; .38 Long Colt; .38 Colt Special; .38 Colt Special Hi-Speed; .38 S. & W. Special (full and mid-range loads); .38 S. & W. Special High Velocity; .38-44 S. & W. Special).
- **.22 Long Rifle** (See page 23).

General Specifications

LENGTHS OF BARREL: 4, 4½, 5, 6 or 7½ inches. Heavy Type Barrel, 6 inch only, on .38 Caliber Model. .32 Caliber 6 inch heavy barrel only.
LENGTH OVER ALL: With 6-inch barrel, 11¼ inches.
STOCKS: Checked Walnut.
TRIGGER: Checked.
ACTION: Super-smooth, hand finished.
SIGHTS: "Patridge" (regularly furnished) or "Bead". Both non-reflecting; Front Sight adjustable for elevation; Rear Sight adjustable for windage.
FINISH: Full Blued; top of frame stippled to eliminate reflection and glare.
BACK STRAP: Checked.
WEIGHT: With 6-inch barrel, (.38 Caliber) 34 ounces; with 6 inch Heavy barrel, 36 ounces.

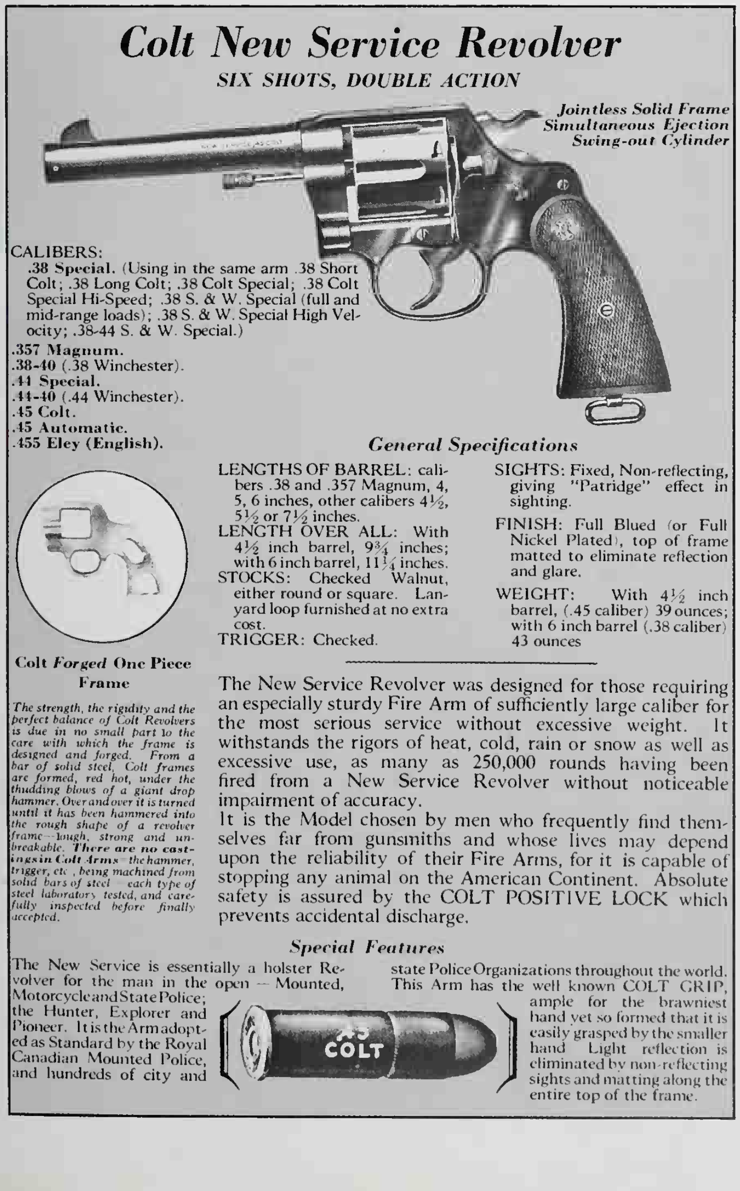
Heavy Barrel

The Officers' Model is available with Heavy Barrel, (6 inch length only) the same as furnished in the Shooting Master. Adds 2 ounces to weight of gun. Specify Standard or Heavy Barrel in ordering. Both same price.

This Revolver is made from forgings of finest selected steels, every part carefully tested, finished and assembled by hand by skilled workmen. Each Arm is target tested by firing 12 to 18 rounds of various standard loaded ammunition, and a signed 5 shot test target is included with every Arm.
The Colt Officers' Model well merits its reputation as the most popular .38 Caliber Target Revolver produced, maintaining Colt's Standard of Quality, Durability, Accuracy and Safety — the latter being assured by the COLT POSITIVE LOCK — an especially desirable feature for range shooting. Where there are target shooters, there you will find the Colt Officers' Model Target Revolver.

Special Features

Target shooters who like a little extra weight in the muzzle end of their target revolvers will find the Officers' Model with heavy (Shooting Master) barrel, exactly to their liking. Two ounces have been added to the weight of the gun, all in the barrel. It steadies the arm for rapid fire shooting, and balances the gun beautifully. Either standard or heavy type barrels can be furnished. The .22 Caliber model, which weighs 38 ounces with its present barrel, will not be furnished with a heavier barrel. Both .22 and .38 Caliber models handle the High Speed cartridges, the .22 Caliber model being furnished with the Colt Embedded Head Cylinder to eliminate possibility of split cartridge heads.



Colt New Service Revolver

SIX SHOTS, DOUBLE ACTION

Jointless Solid Frame
Simultaneous Ejection
Swing-out Cylinder

CALIBERS:
.38 Special. (Using in the same arm .38 Short Colt; .38 Long Colt; .38 Colt Special; .38 Colt Special Hi-Speed; .38 S. & W. Special (full and mid-range loads); .38 S. & W. Special High Velocity; .38-44 S. & W. Special.)
.357 Magnum.
.38-40 (.38 Winchester).
.44 Special.
.44-40 (.44 Winchester).
.45 Colt.
.45 Automatic.
.455 Eley (English).

Colt *Forged* One Piece Frame

The strength, the rigidity and the perfect balance of Colt Revolvers is due in no small part to the care with which the frame is designed and forged. From a bar of solid steel, Colt frames are formed, red hot, under the thudding blows of a giant drop hammer. Over and over it is turned until it has been hammered into the rough shape of a revolver frame—tough, strong and unbreakable. ***There are no castings in Colt Arms*** *the hammer, trigger, etc., being machined from solid bars of steel — each type of steel laboratory tested, and carefully inspected before finally accepted.*

General Specifications

LENGTHS OF BARREL: calibers .38 and .357 Magnum, 4, 5, 6 inches, other calibers 4½, 5½ or 7½ inches.
LENGTH OVER ALL: With 4½ inch barrel, 9¾ inches; with 6 inch barrel, 11¼ inches.
STOCKS: Checked Walnut, either round or square. Lanyard loop furnished at no extra cost.
TRIGGER: Checked.

SIGHTS: Fixed, Non-reflecting, giving "Patridge" effect in sighting.

FINISH: Full Blued (or Full Nickel Plated), top of frame matted to eliminate reflection and glare.

WEIGHT: With 4½ inch barrel, (.45 caliber) 39 ounces; with 6 inch barrel (.38 caliber) 43 ounces

The New Service Revolver was designed for those requiring an especially sturdy Fire Arm of sufficiently large caliber for the most serious service without excessive weight. It withstands the rigors of heat, cold, rain or snow as well as excessive use, as many as 250,000 rounds having been fired from a New Service Revolver without noticeable impairment of accuracy.

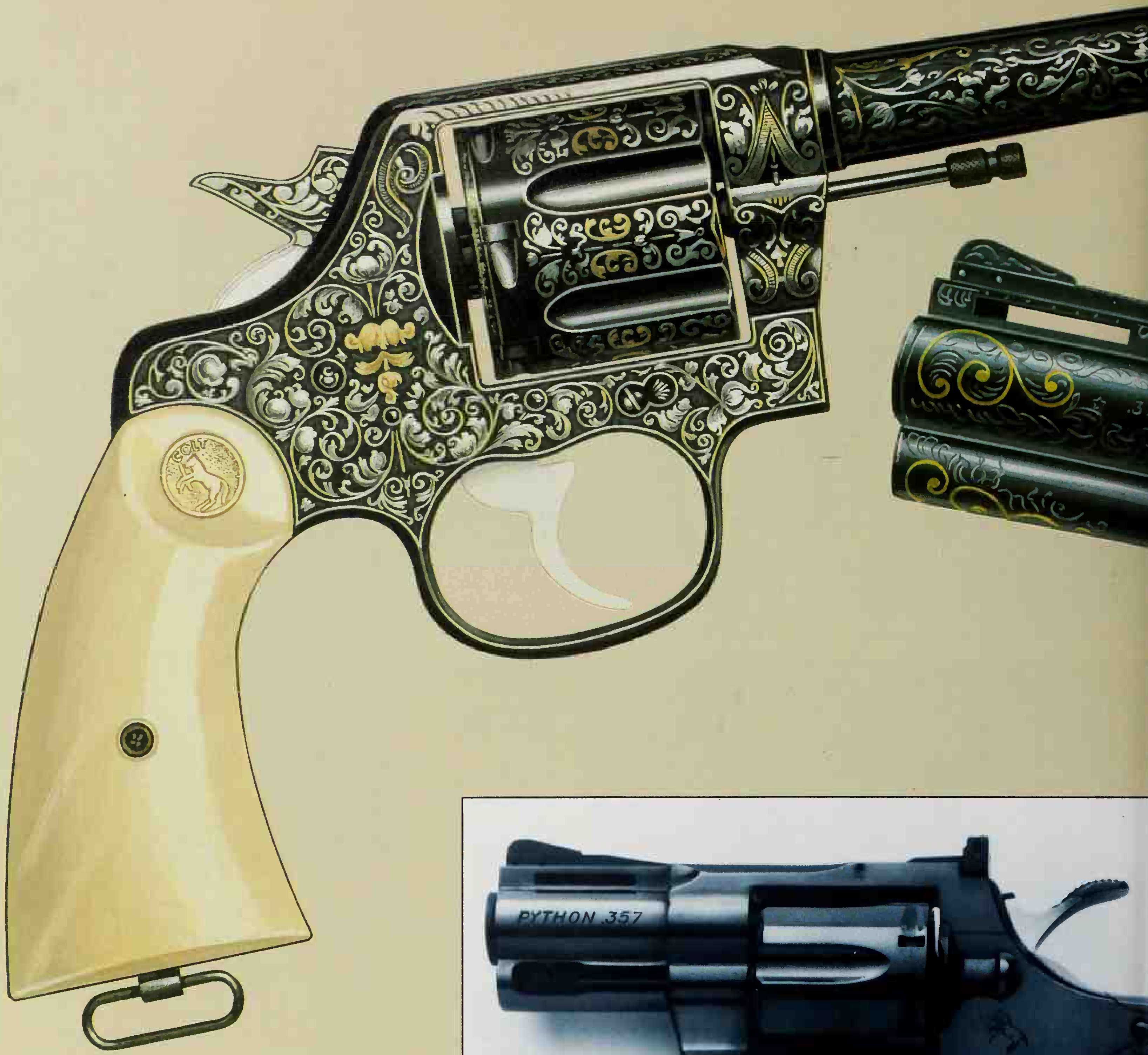
It is the Model chosen by men who frequently find themselves far from gunsmiths and whose lives may depend upon the reliability of their Fire Arms, for it is capable of stopping any animal on the American Continent. Absolute safety is assured by the COLT POSITIVE LOCK which prevents accidental discharge.

Special Features

The New Service is essentially a holster Revolver for the man in the open — Mounted, Motorcycle and State Police; the Hunter, Explorer and Pioneer. It is the Arm adopted as Standard by the Royal Canadian Mounted Police, and hundreds of city and state Police Organizations throughout the world. This Arm has the well known COLT GRIP, ample for the brawniest hand yet so formed that it is easily grasped by the smaller hand. Light reflection is eliminated by non-reflecting sights and matting along the entire top of the frame.

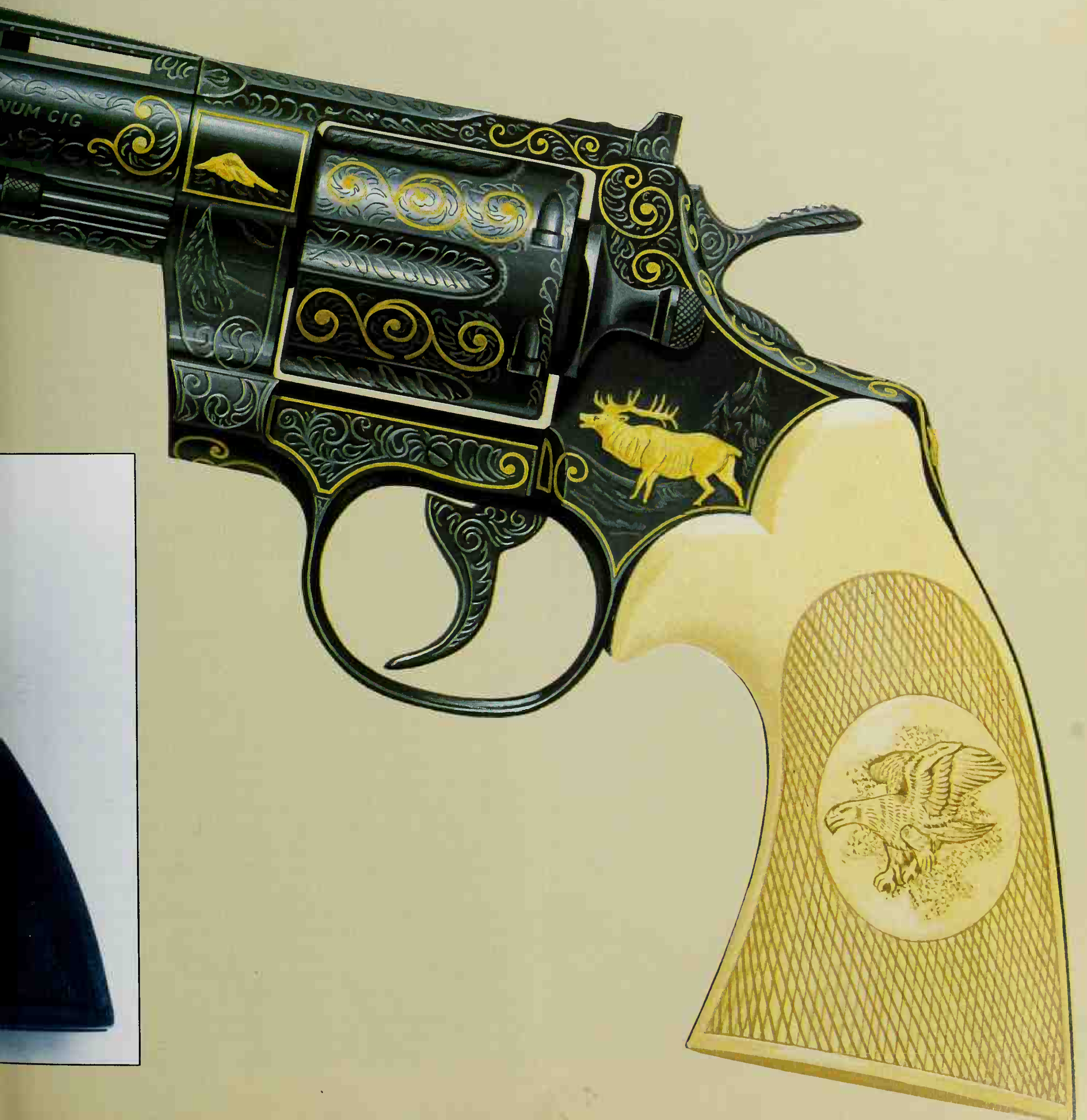
knowledgeable gunsmiths. Ventilated ribs and underslung barrel weights had been added to increase their accuracy.

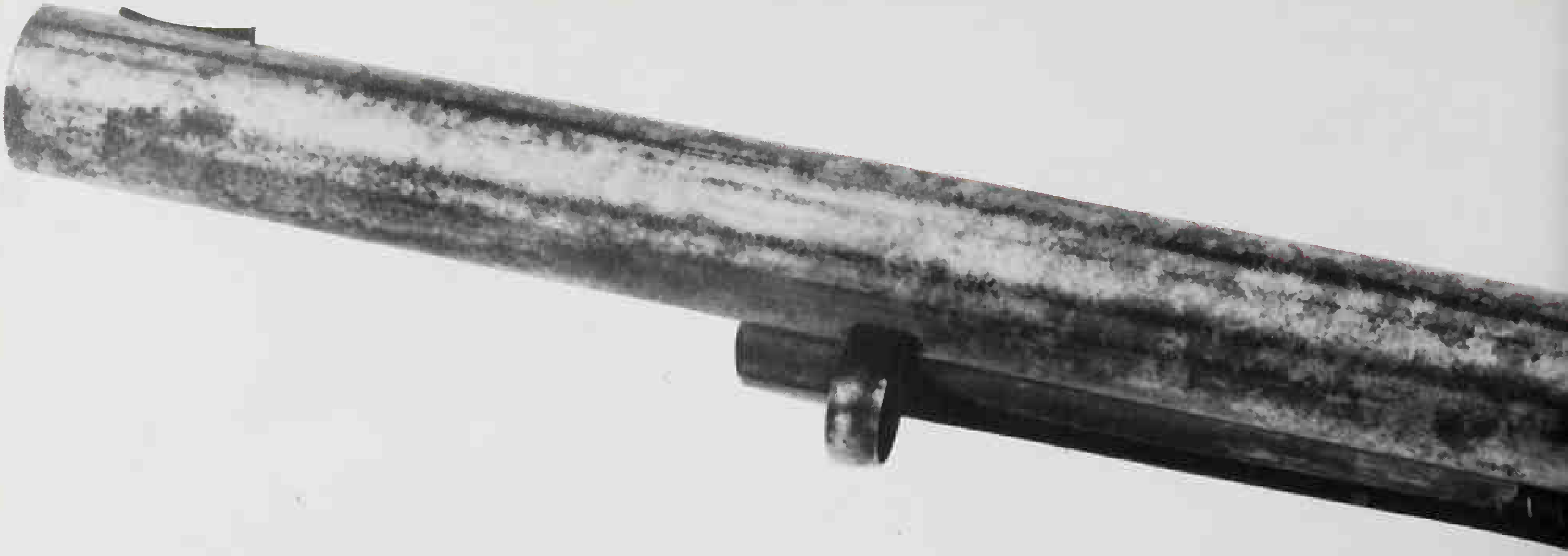
Even though Smith and Wesson had produced .357 Magnums before the Python appeared, it was Colt's idea to produce a *deluxe* Magnum pistol. The name 'Python' actually came from a contest among Colt factory employees, and not from anyone in the advertising division of the company. Stainless steel Pythons would appear later, but the original Python featured a special finish referred to as Colt Royal Blue. This Royal Blue finish is still the most popular today. It is a concession to the fact that the appearance of beautiful, deep blueing is not a function of the blueing procedure itself as much as it is a process of the polishing—which takes place after the blueing. Royal Blue is achieved by the use of extremely fine grit sand papers and crocus cloths that are used on the exterior parts. The Python took the market by storm, even though it was somewhat more expensive than its competitors, the Smith and Wesson Highway Patrolman, the Combat Magnum, and the Smith and Wesson .357 Magnum. Not only was the finish unexpectedly beautiful, but the internal action of the Python was equally as

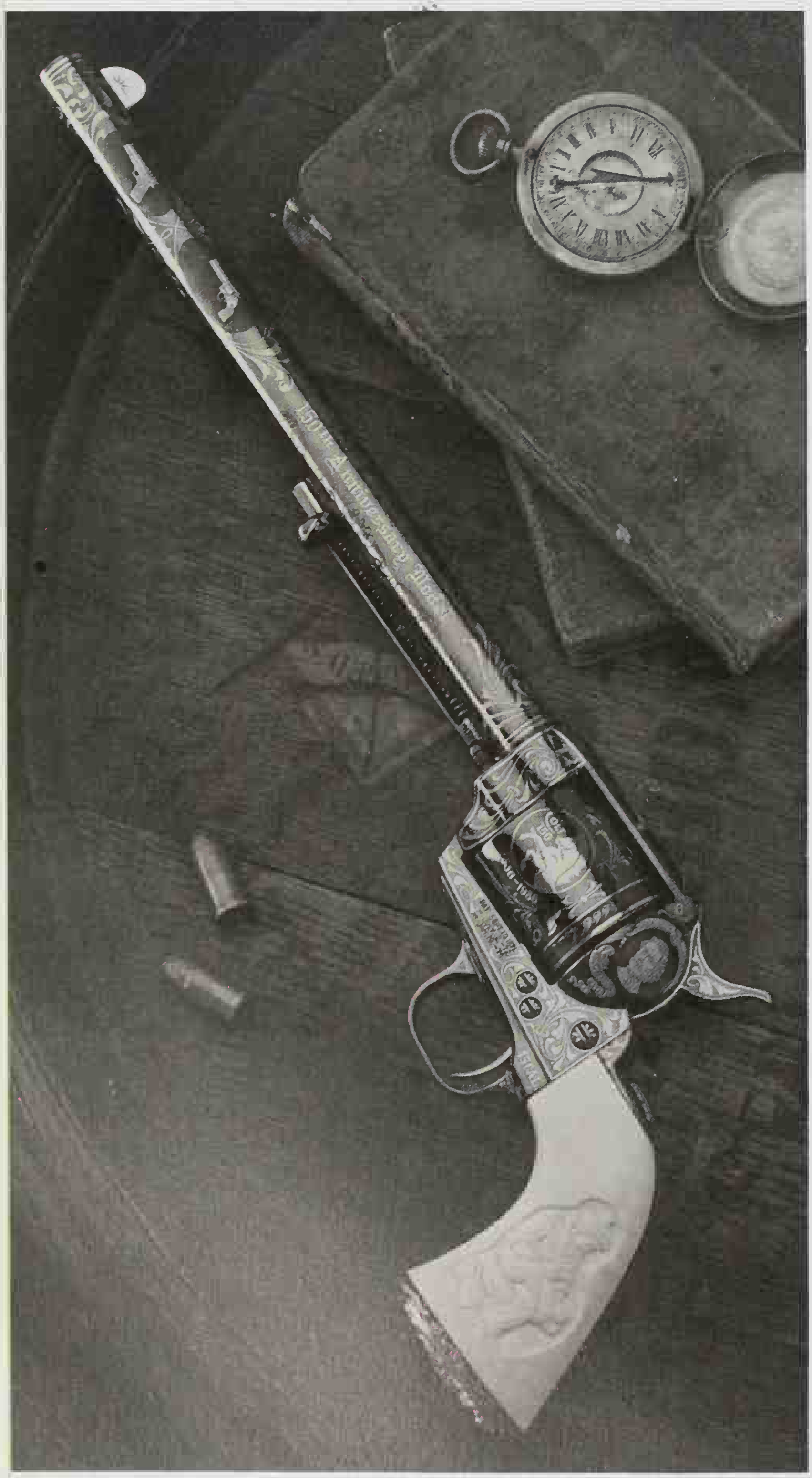

COLT

PYTHON .357

At left: The New Service Revolver, made from 1897 to the mid-1940s, was produced in countless variations, and was available in plain and (as shown here) very fancy models. *Below:* A highly engraved Python .357 Magnum with vented barrel rib. *Below left:* A snubnosed stainless steel Python. The Colt Python design is known as the 'Rolls Royce' of revolvers.







astounding. The internal parts of these first Pythons were hand polished, producing an action that was silky smooth and seemingly friction-free.

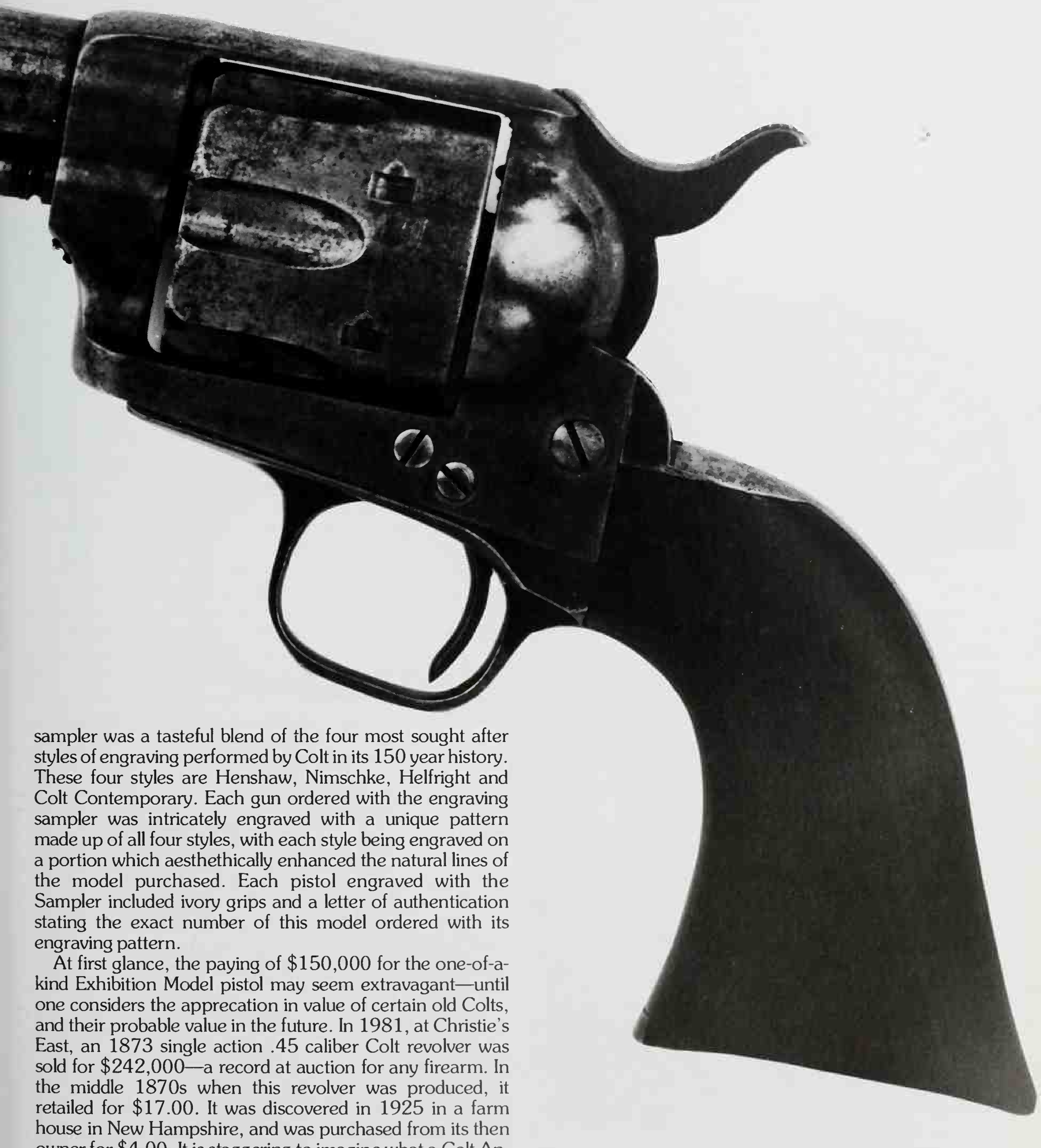
The Python is a rather heavy pistol, weighing 34 ounces. The weight is distributed more toward the muzzle, thus offering target shooters a balance which results in more accurate sighting of the target in rapid-fire situations. This increased weight also contributes to the Python's ability to absorb recoil even when using large caliber cartridges.

The Python reigns as the 'Rolls Royce' of revolvers and as the hand gun most enthusiasts dream of owning. From the initial machining of its forged frame to its final polishing, through many hours of hand work, the Python is the pinnacle of American gunsmithing today. It is available in four barrel lengths—2.5 inch, four inch, six inch and eight inch. The finishes are Royal Blue with walnut grips, stainless steel and heavily polished Ultimate stainless steel with black Colt neoprene grips. All Pythons are equipped with red insert front sights and adjustable white outline rear sights. The Python can be considered an investment in a precision double action revolver, and it is currently backed by an unprecedented 10 year limited warranty.

Today, Colt firearms carries on a tradition of innovation stretching back 150 years. Even with sophisticated techniques such as laser bore sighting, the bedrock of Colt's quality still rests in the skilled hands of its craftsmen, working with the timeless strength of forged steel. In 1986, the Custom Shop at Colt undertook its most expansive project in the 150 years of Colt's existence. The 150th Anniversary Exhibition Model, a .45 caliber Colt single action one-of-a-kind Army Model Pistol was auctioned at a black tie affair in Las Vegas in 1986. This revolver is heavily embellished with gold inlaid motifs, border bands, and scroll work. It is appropriately serial numbered 'Colt-150.' The genuine hand carved ivory grips are enhanced by a solid gold butt cap depicting a patriotic eagle, with a small diamond being the eagle's eye. Included with this pistol was a custom designed, solid ebony and cocobolo-wood presentation case with an ivory hand carved Colt medallion insert. Even a leather bound scrapbook, detailing its 1986 Exhibition Tour and a museum quality exhibition case were included. Starting price for the bidding was set at $150,000.00!

Fortunately, one did not have to be invited to the black tie auction in Las Vegas in order to purchase an 'Anniversary Commemorative Colt Pistol.' An 'Anniversary Engraving Sampler' was offered to all Colt customers who purchased a currently-produced blue or nickel finished gun in 1986. This 'Engraving Sampler' was a unique concept, in that the

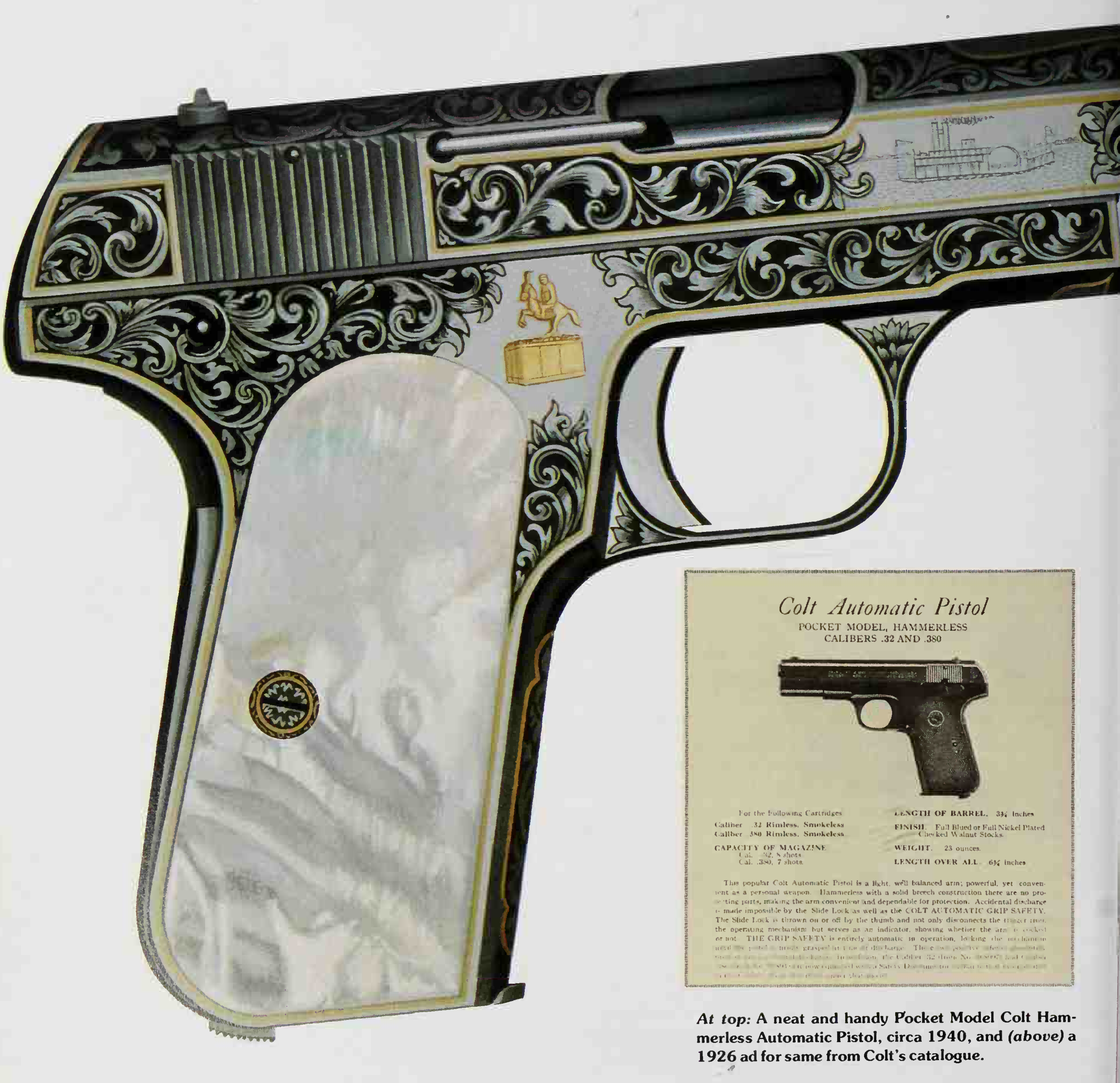
Collectors' items—Although Colt's 150th Anniversary Exhibition Gun *(opposite)* had a $150,000 auction price tag, a humble old Single Action Army Frontier Model similar to the one *below* (but with serial number 1) fetched $242,000 at an auction at Christie's East in 1981.



sampler was a tasteful blend of the four most sought after styles of engraving performed by Colt in its 150 year history. These four styles are Henshaw, Nimschke, Helfright and Colt Contemporary. Each gun ordered with the engraving sampler was intricately engraved with a unique pattern made up of all four styles, with each style being engraved on a portion which aesthethically enhanced the natural lines of the model purchased. Each pistol engraved with the Sampler included ivory grips and a letter of authentication stating the exact number of this model ordered with its engraving pattern.

At first glance, the paying of $150,000 for the one-of-a-kind Exhibition Model pistol may seem extravagant—until one considers the apprecation in value of certain old Colts, and their probable value in the future. In 1981, at Christie's East, an 1873 single action .45 caliber Colt revolver was sold for $242,000—a record at auction for any firearm. In the middle 1870s when this revolver was produced, it retailed for $17.00. It was discovered in 1925 in a farm house in New Hampshire, and was purchased from its then owner for $4.00. It is staggering to imagine what a Colt Aniversary Pistol may be worth 20 or 30 years from now.

Automatic and



Colt Automatic Pistol

POCKET MODEL, HAMMERLESS
CALIBERS .32 AND .380

For the Following Cartridges
Caliber .32 Rimless, Smokeless
Caliber .380 Rimless, Smokeless

CAPACITY OF MAGAZINE
Cal. .32, 8 shots
Cal. .380, 7 shots

LENGTH OF BARREL. 3¾ inches

FINISH. Full Blued or Full Nickel Plated
Checked Walnut Stocks.

WEIGHT. 23 ounces.

LENGTH OVER ALL. 6¾ inches

This popular Colt Automatic Pistol is a light, well balanced arm; powerful, yet convenient as a personal weapon. Hammerless with a solid breech construction there are no projecting parts, making the arm convenient and dependable for protection. Accidental discharge is made impossible by the Slide Lock as well as the COLT AUTOMATIC GRIP SAFETY. The Slide Lock is thrown on or off by the thumb and not only disconnects the trigger from the operating mechanism but serves as an indicator, showing whether the arm is cocked or not. THE GRIP SAFETY is entirely automatic in operation, locking the mechanism [illegible]

At top: **A neat and handy Pocket Model Colt Hammerless Automatic Pistol, circa 1940, and *(above)* a 1926 ad for same from Colt's catalogue.**

Pistols Rifles

The invention in the latter 19th century of a new type of gunpowder caused a revolution in ballistics circles. This new powder burned much more efficiently than did black powder. You could pack more punch into a smaller cartridge, and all sorts of interesting things could be done with larger cartridges. Firearms had to be manufactured with more stress capacity to handle this hot new stuff, and therefore arms technology *really* started to take off. This new powder, incidentally, didn't stink the place up so much as did black powder, and it was called 'smokeless powder.'

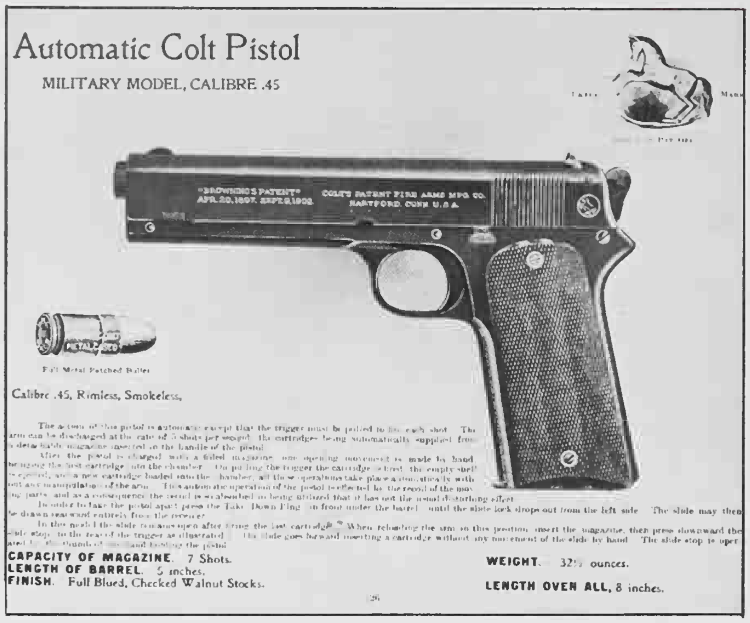
The principle of any automatic weapon is very simple. When the initial cartridge is fired, the natural recoil from the explosion is used to do two things—namely, eject the spent shell and reload a new cartridge into the chamber. A 'fully' automatic weapon is one in which only one trigger depression is needed to set off a simultaneous series of shots. The designation 'semi-automatic' is used to differentiate the action from a 'fully-automatic' one in that a 'semi-automatic' will fire, eject and reload only one cartridge per trigger pull. A further differentiation between automatic-type weapons can be made on the basis of whether the energy used to eject the spent cartridge and reload the new one is derived from recoil, or whether it is derived from utilizing expanded gases which are released during the detonation. Most automatic weapons are of the recoil type operation, whereas some larger machine guns are operated on the gas expansion basis.

John M Browning, of Browning Arms fame, is credited with originating the idea of firearms that could load and unload themselves. In experiments in the early 1890s, Browning noticed that when a gun was fired, not only did the projectile fly out of the end of the barrel, but gases were released out that same opening. Browning noticed this phenomenon when he observed that as a gun is fired in close proximity to tall grasses or weeds, the explosion violently disturbs the adjacent foilage. He concluded that there must be some way of utilizing that otherwise wasted energy.

The principle of rapid fire guns, at least, was nothing new to Colt Firearms. From the middle 1860's, Colt had produced the famous Gatling gun. These 10-barreled guns could fire 600 rounds per minute of .45-70 cartridges. But of course, their power to fire at such rates was entirely dependent on the human muscle of the operater. Still, the Gatling guns were the best of the rapid-fire weapons for many years.

John Browning concluded that since Colt was at the forefront of rapid-fire weapons, they would be most interested in his ideas and patents. He was right. In 1895 the Colt/Browning Automatic Gun was brought to the marketplace. This tripod-mounted, air-cooled and belt fed machine gun could fire 400 shots per minute. It was used to great advantage in both the Spanish-American War and in World War I. But, obviously, these kinds of weapons were not intended for the general public. This, however, did not preclude the general populace from wanting handguns that operated on this same automatic principle.

Colt became the first American manufacturer of an automatic pistol in 1900. The Model 1900 was a .38 caliber weapon weighing 37 ounces, having a barrel six inches in length and a magazine capacity of seven shots. These seven shots were of a new straight-cased .38 caliber rimless cartridge that was capable of a velocity of 1260 feet per second—a truly astounding speed for the times. The Model 1900, even though it was manufactured by Colt, was in fact based on the 1897 patents of the Browning Arms Company. On 20 April, 1897, Browning filed a series of four patents which were to remain the benchmarks of automatic



Automatic Colt Pistol

MILITARY MODEL, CALIBRE .45

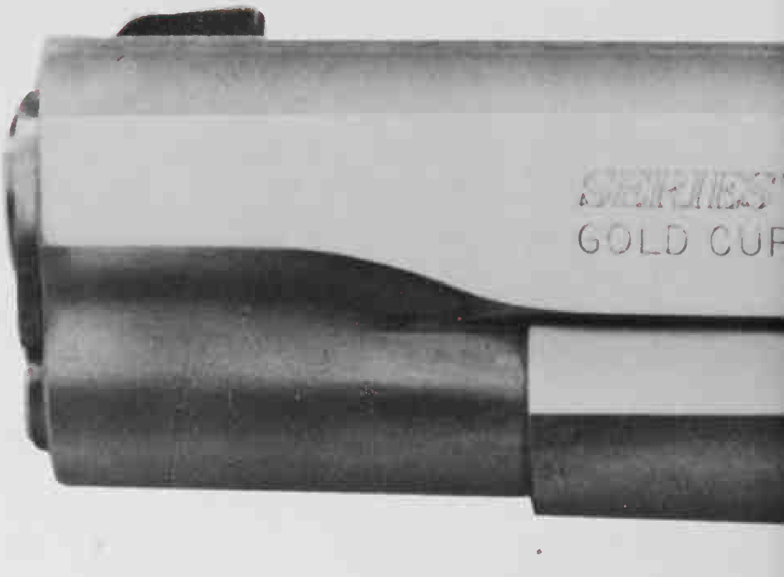
"BROWNING'S PATENT" APR. 20, 1897. SEPT. 9, 1902.
COLT'S PATENT FIRE ARMS MFG. CO. HARTFORD, CONN. U.S.A.
METAL CASED

Full Metal Patched Bullet

Calibre .45, Rimless, Smokeless,

CAPACITY OF MAGAZINE. 7 Shots.
LENGTH OF BARREL. 5 inches.
FINISH. Full Blued, Checked Walnut Stocks.

WEIGHT. 32½ ounces.
LENGTH OVER ALL, 8 inches.



pistols into the 1940s. Indeed, the date of 'April 20' was so important that it was imprinted onto each weapon for many years. Many innovations followed with succeeding models coming out in 1902, 1903, 1905, 1907, 1908 and 1911. This time frame, from 1897 until 1911, is accounted by many to be one of the most innovative and creative periods in Colt's history. This combination of Browning's originality and Colt's precision manufacturing set down the basics for automatic weapons to this day.

Calibrations for Colt automatic pistols are much simpler than for Colt revolvers. Only .22 rimfire, .25, .32, .380, .38, .38 Special, Super .38, 9mm, .45 and .455 have been produced.

An interesting abbreviation appears beside certain calibers of automatic weapons. This abbreviation, 'ACP,' stands for Automatic Colt Pistol. The 'ACP' shell casings differ from other cartridges in that there is a reduced indenture of rim at the rear of the cartridge. This is to enable the cartridge to be quickly loaded and ejected by the automatic weapon's mechanism.

It is interesting, and somewhat humorous, to note that when the Model 1900 came out, the first people to shoot it had a difficult time getting used to the automatic character of the weapon. Generally, when a person began shooting an automatic pistol, because he did not know what to expect out of this device, his shots were generally far from accurate (to say the least). The Great Unknown was very disquieting to those first automatic shooters. But one quickly caught on to the tremendous advantages of an automatically loading and ejecting weapon. The 'trigger finger' had been rediscovered as a vital part of the human anatomy!

When the first prototype of the Model 1900 was submitted to the US Ordnance Board, their tests proved somewhat inconclusive. The Board stated that, 'This type of pistol has not yet reached such a stage as to justify its adoption in the place of the revolver for Service use.' Reliability was the key question involved in whether the government should abandon the revolver as the military's sidearm weapon of issue and go with the new automatic.

In time, however, the Colt automatic was adopted by the military. Of the 4.7 million Colt automatic pistols that have been produced, the US Government has been the purchaser of at least three million of them. While many different models of automatic pistols have been, and still are, produced by Colt with numberless variations among these different basic styles, the model 1911 and the 1911 A-l still rank as the company's best selling automatics.

Currently, the Gold Cup National Match Mark IV Series 80 is the top of the line Colt automatic pistol. It has a barrel length of five inches and weighs 39 ounces. The Gold Cup is

COLT MK IV
SERIES 80
COLT MK IV
SERIES 80

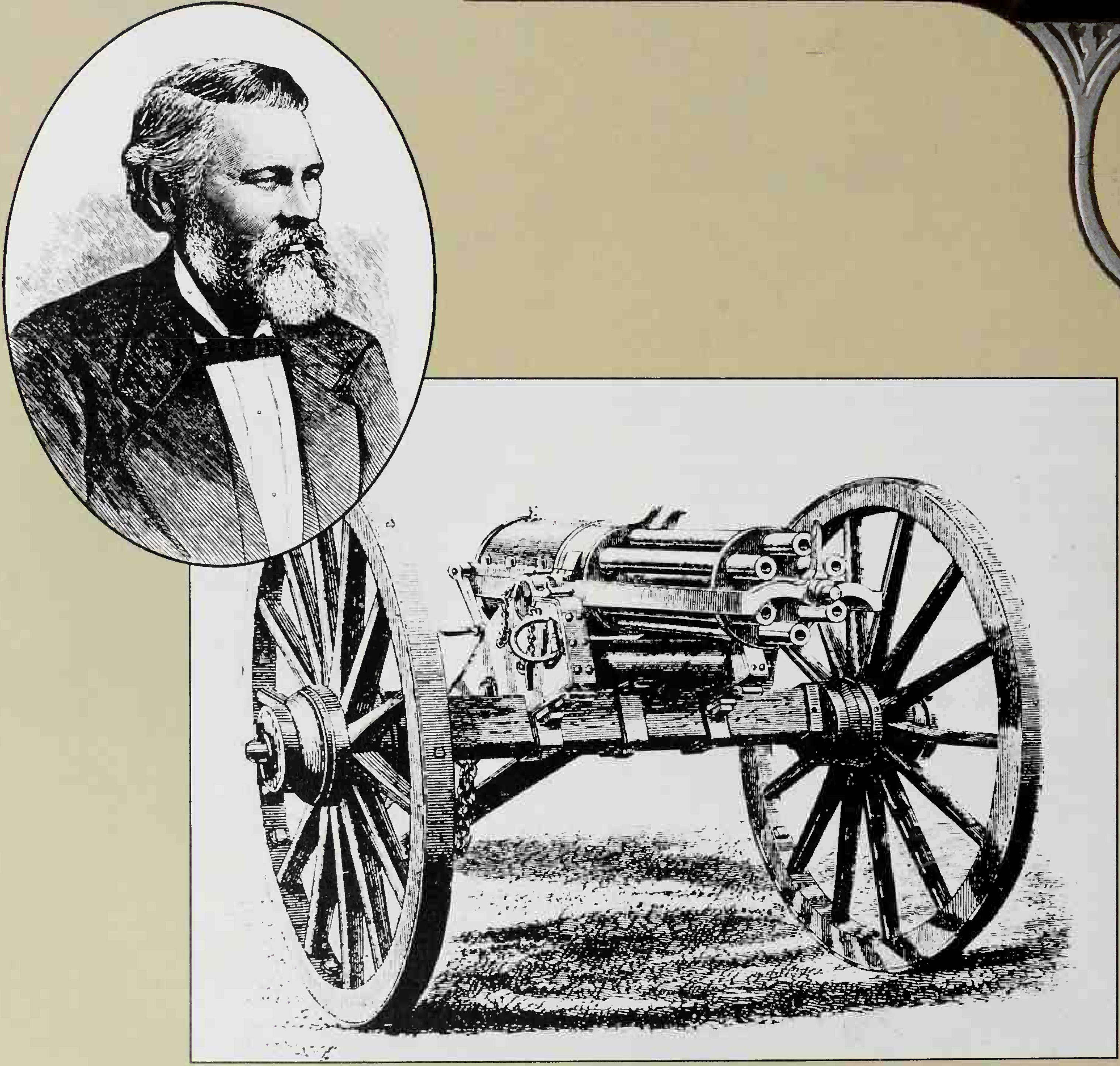
OLT MK IV
ONAL MATCH
COLT

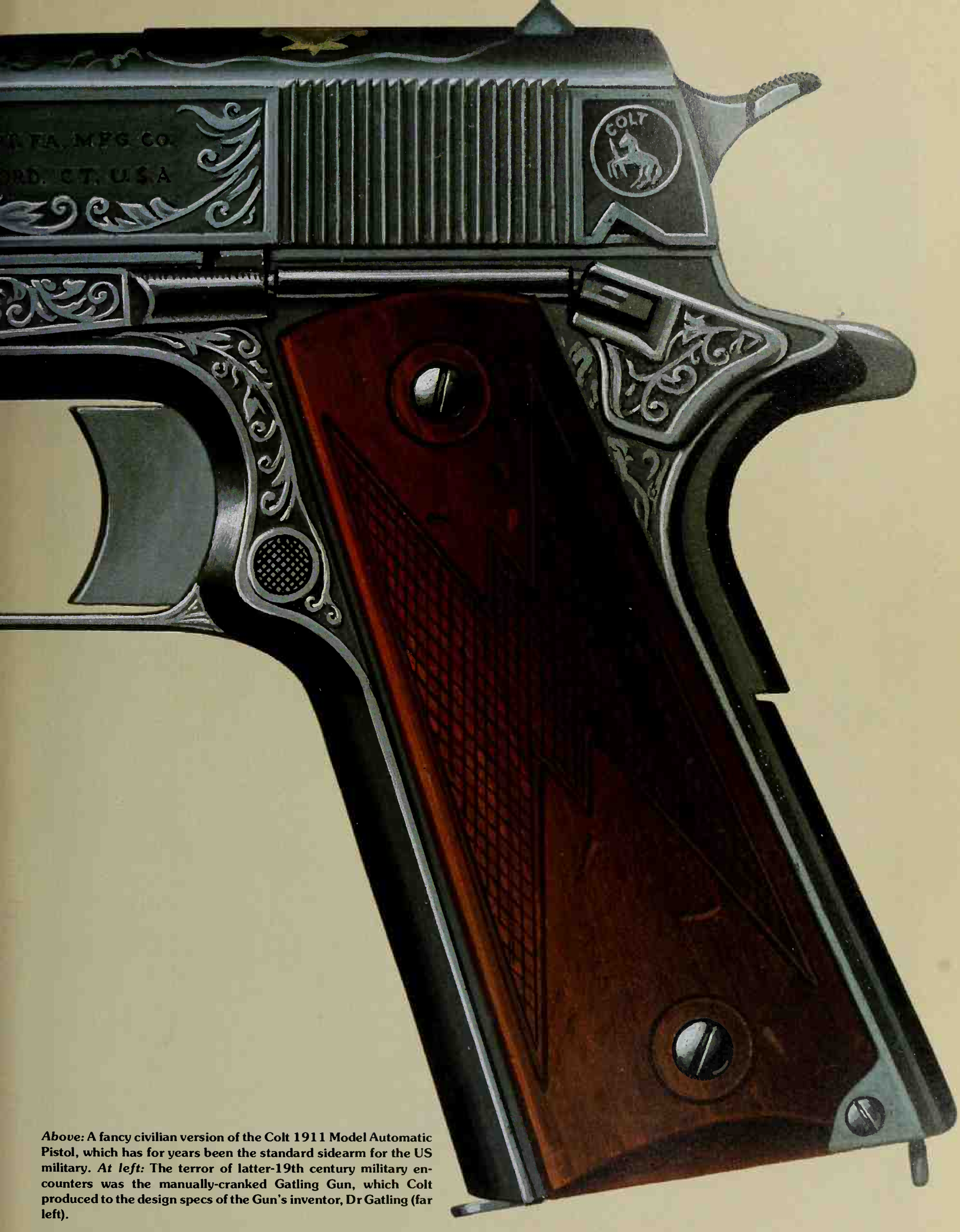
the premier American center-fire automatic target pistol, with its accurizor barrel that tightens shot groupings by as much as 90 percent. This Colt automatic is acclaimed as one of the world's finest match scorers. It features a wide grooved trigger with an adjustable top, serrated target hammer, and flat back-strap mainspring housing. It also features the revolutionary Firing Pin Safety, which allows the bearer to carry a round in the chamber in the 'cocked and locked' position—which enables the shooter to deliver consistent trigger pull on all shots, rather than the heavy first pull of a double action.

SERIES '80 COLT MK IV
GOLD CUP NATIONAL MATCH

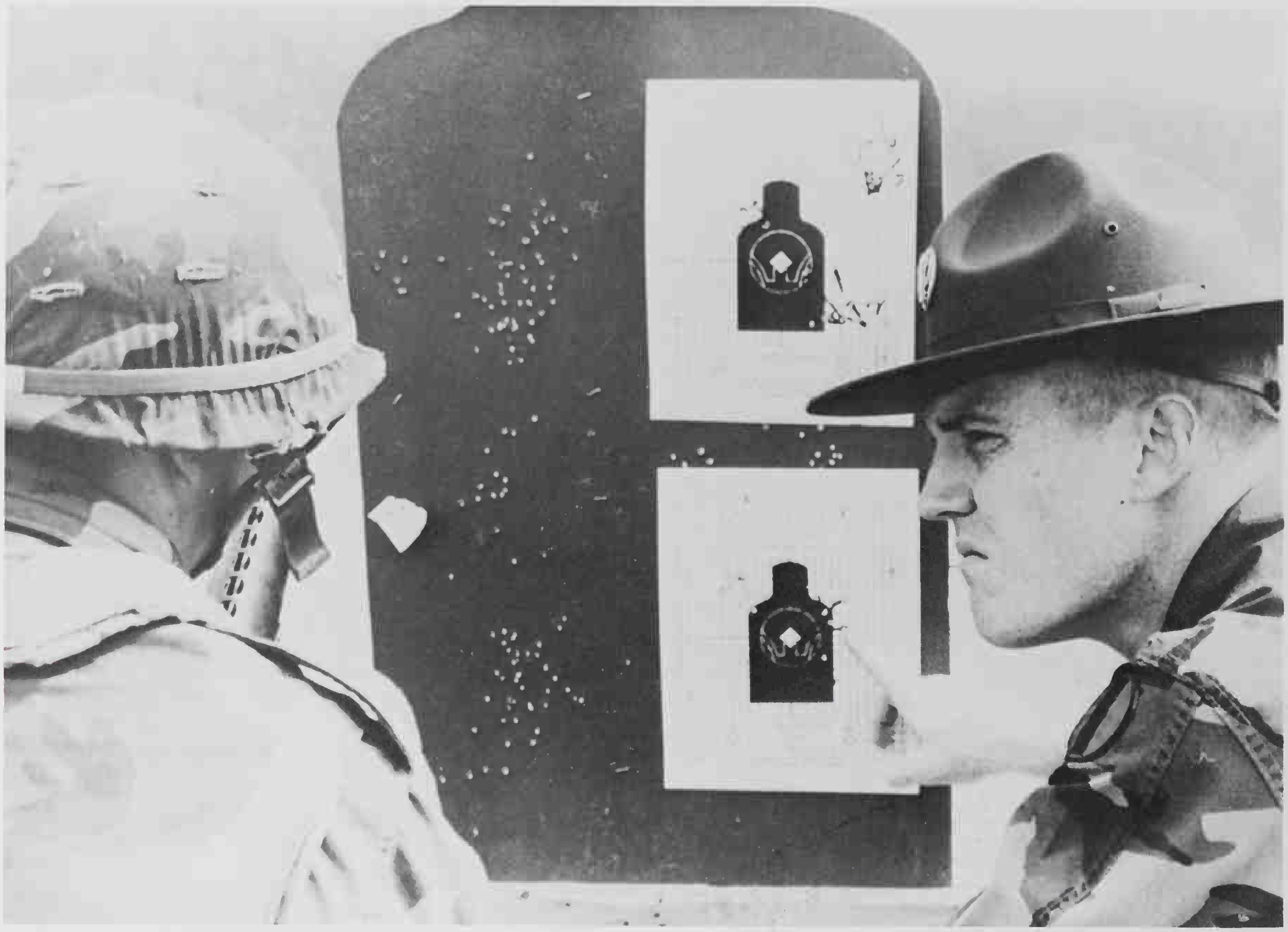
From its historic beginnings, Colt has continued to improve its line of automatic pistols to include, *clockwise from left:* the Stainless Steel Gold Cup National Match; the MK IV Combat Elite Series 80; the MK IV Stainless Steel Officer's model; MK IV Series 80 Gold Cup National Match; and a 1905 advertisement which states that the Automatic Colt Pistol is 'automatic except that the trigger must be pulled to fire each shot.'

PATENTED APR 20 1897. SEPT 9 1902.
DEC 19 1905. FEB 14 1911. AUG 19 1913





Above: A fancy civilian version of the Colt 1911 Model Automatic Pistol, which has for years been the standard sidearm for the US military. *At left:* The terror of latter-19th century military encounters was the manually-cranked Gatling Gun, which Colt produced to the design specs of the Gun's inventor, Dr Gatling (far left).



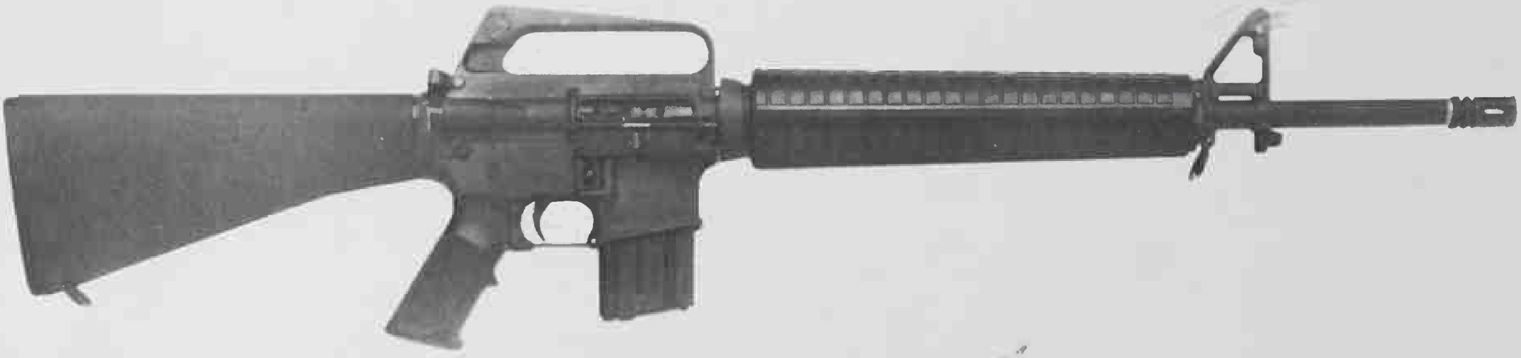
***Above:* This drill sergeant shows a soldier how to 'zero in' his M16 for better accuracy. *Below:* An AR-15 A2 Sporter II—one variant of its military cousin, the M16. *Opposite:* US Marines and their M16s, on guard at the terrorist-bombed US embassy in Beirut, in the early 1980s.**

Undoubtedly, the most famous of Colt's automatic weapons are the AR-15 and M16 Automatic and semi-automatic rifles. The caliber of these rifles is .223.

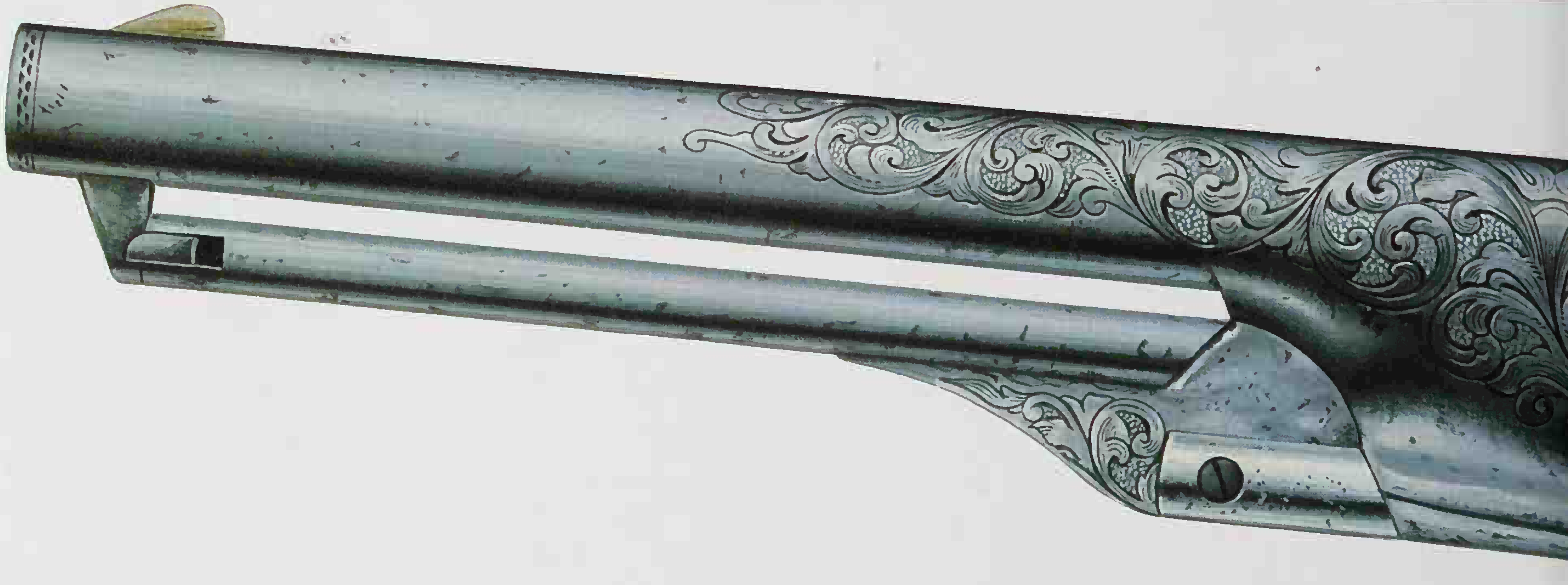
In the early 1960s, Colt acquired the rights to produce and market the AR-15 rifle from the Armalite Division of the Fairchild Engine and Airplane Corporation. Colt Arms had the connections necessary to place this rifle, in large quantities, into the hands of both law enforcement and government officials. The US Army began contracting for these rifles in 1963, partly at the request of General Curtis LeMay. As US involvement in Southeast Asia increased and the war in Vietnam began to unfold in ever greater ferocity, more and more AR-15 rifles were ordered by the government. So many AR-15s were put on the front lines that the weapon was adopted as the replacement for the then-standard M14 rifle. Because the AR-15 replaced the M14, its name was changed to the M16. Today, however, the designation AR-15 is still to be found on the civilian version of this military weapon known as the Sporter.

As the M16 found its way into different environments of hostilities, variations were produced in accordance with need. Today the M16 is available in carbine, heavy assault rifle, submachine gun, light machine gun and survival pack models, and even is equipable as a grenade launcher.

Colt Industries spent literally millions of dollars in plant production equipment for the M16 as well as a new test range complex built in West Hartford, Connecticut. Even foreign plants are licensed by Colt for the protection of the M16 in Korea, the Philippines and Indonesia. Few products of any type or variety produced by any manufacturer have enjoyed the ready recognizability of the Colt-made M16 Automatic Rifle.



Craftsmanship Twentieth



The following account, in the form of a tour of Colt's Hartford, Connecticut, factory, was originally published in 1940 in *A Century of Achievement*. The insights contained here are as good a view into the heart and soul of Colt's commitment to craftsmanship as they are into the factory itself. Though this selection may be from another time, the spirit and commitment are still alive and well, such that it could have been written yesterday.

Because raw steel is such a vital factor in the production of a firearm, the greatest care is given to its selection. Before a machine even touches it, the steel itself must conform to the most rigid of specifications.

Steel mills have on their order files the specifications which Colt metallurgists have laid down as the kind of steel they want. In a New Jersey mill, a quantity of steel is being made. It is given a heat number. Billet samples of this raw steel before it is rolled into shape are sent to the Colt factory for approval. To the laboratory it goes. It is given a Brinell test to determine its hardness, which is another way to say whether it is machineable or not. Too soft, it will tear; too hard, it will ruin the cutters.

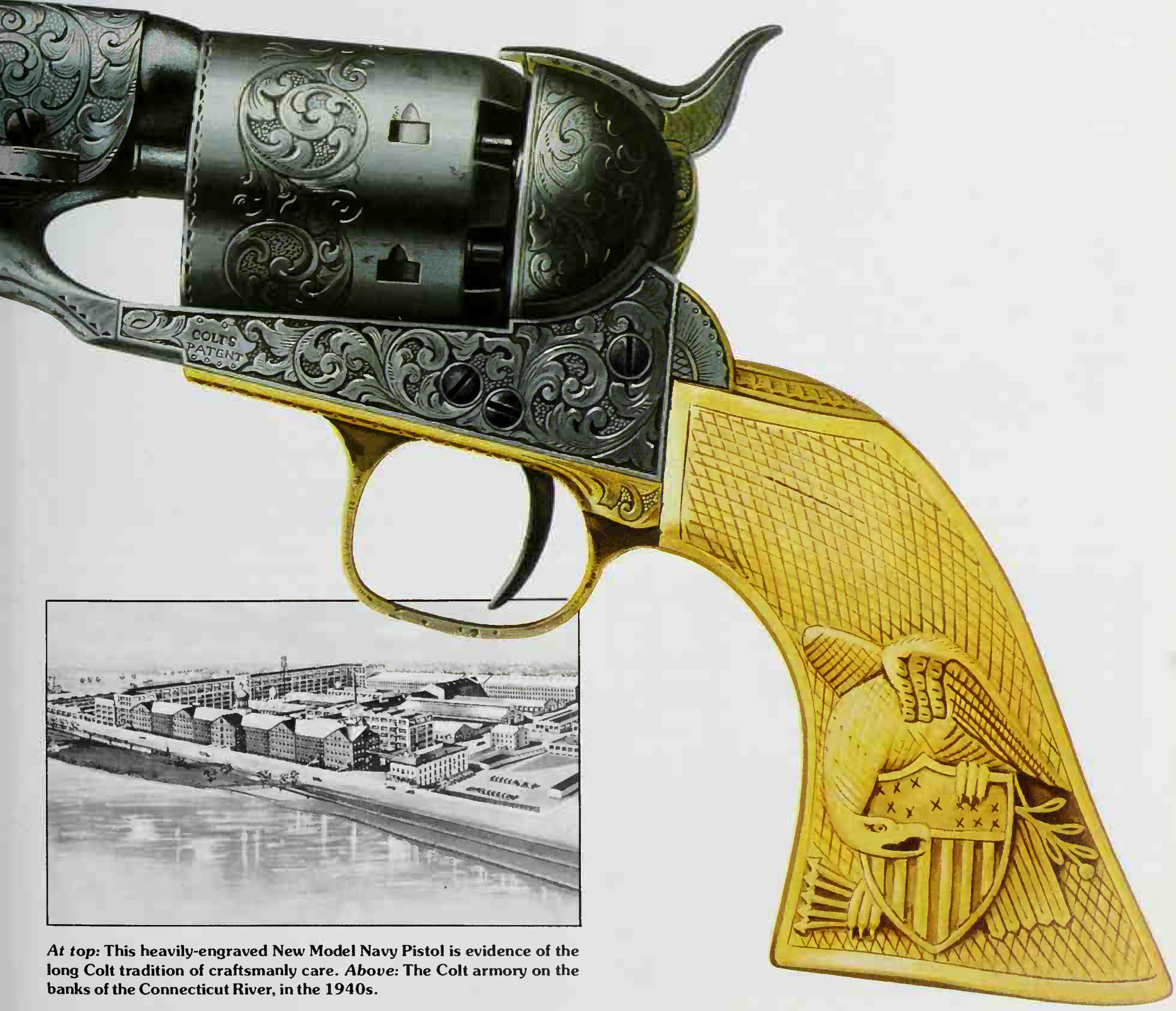
The billet samples are submitted to chemical and physical inspections. They are acid etched to reveal defects. They are fractured three separate times: first for grain size; then hardened, tested for hardness and fractured a second time as hard; and as a final test to determine their toughness, they are drawn and then fractured as drawn.

If the billet samples are OK'd, the steel mill is notified that the particular heat number has been approved and to proceed to roll the steel into the specific pieces and sizes on order by Colt. Steel men often say that the Colt people are 'almost unreasonable' in their demands.

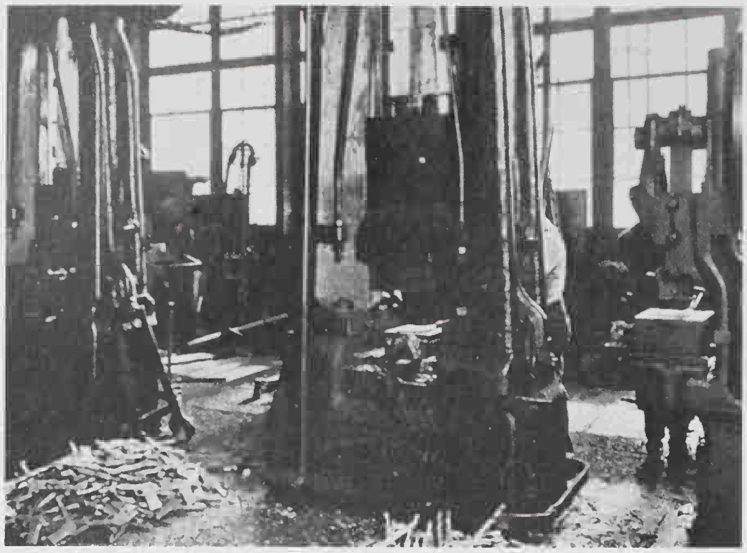
From the steel sheds and laboratory, the forging shop is our first stop. A blank is heated red hot. With long tongs it is placed on the forge. A giant weight, released by the mechanism of a foot pedal, forges the steel between the two dies into shape. Literally it pounds the molecules of steel into the desired shape. I watch the frame of my revolver drop forged into a jointless solid piece. It's a terrifying sight, this drop forging. The drop die weighs between 500 and 600 pounds. It drops six feet exerting a force of over 2000 pounds. Sparks fly 10 or 12 feet when the die hits the steel. The terrific heat and the earsplitting noise conjures an image in the mind of some gigantic monster giving full vent to its fury. Across the alley from the forge shop a battery of punch presses trim off the excess metal resulting from the forging. The trimmed pieces are next placed into a steel drum and shot blasted to smooth their surfaces. We open one of the drums where a number of pistol receivers are tumbling. The term 'shot blasting' is well named. Under heavy air pressure a veritable shower of fine steel shot is blasted over all the surfaces, removing all scale.

Down go the forgings to the grinding room. Each individual receiver or frame is set on a heavily magnetized chuck to hold it tightly in place, and is forced between seg-

in the Century



At top: This heavily-engraved New Model Navy Pistol is evidence of the long Colt tradition of craftsmanly care. *Above:* The Colt armory on the banks of the Connecticut River, in the 1940s.



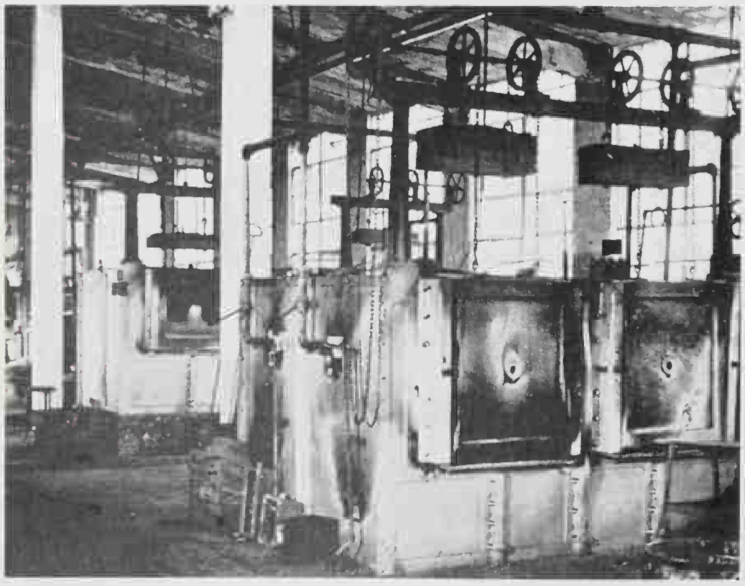
PEACEKEEPER

Colt firearms, such as the Peacekeeper at *above right*, must meet exacting standards. *Immediate right:* Arms expert JH Fitzgerald. *Above:* Colt's Forge Shop—where frames were swaged from solid bars of steel—in the 1940s. *Below:* Heat treating ovens. *Opposite:* Profiling machines.

mented wheels of carborundum whirling in opposite directions. Each piece is ground to the proper thickness, and the top and bottom surfaces are made smooth.

Masters Of Steel

There is probably no more important department in the whole Colt plant than the heat treating room. In this room filled with roaring furnaces, the varying conditions of steel are mastered. Steel is made softer, harder, drawn to fine temper and in a number of ways processed to fit the exact needs that will be demanded of it. For instance, the drop forgings must be normalized before they can be machined. Normalizing the forging prepares the steel so that it can be machined with maximum efficiency—not too soft, not too hard. When all the machining processes are completed, the same pieces are hardened again. Take the slide of an automatic, as an example: it takes a terrible beating. It has to travel back and forth on the receiver every time a shot is fired. Innumerable machine operations are necessary—60 to be exact. After each slide has gone through its machining routine, it is sent back again to the heat treating room to be heat treated. The same thing holds true of barrels and cylinders. Triggers, cranes, latches, sears, firing pins, hammers and etc are also hardened in the heat treating room.



Built Like a Watch But Strong Enough To Stand Dynamite

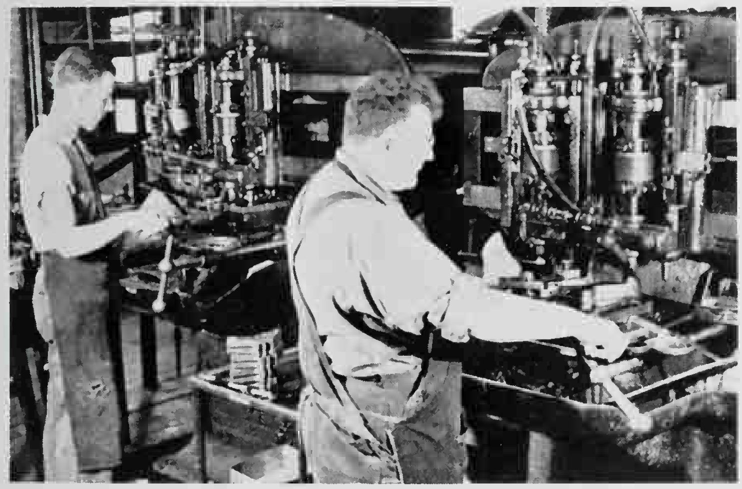
The number of different and separate machine operations that go into the production of a Colt revolver or automatic pistol is simply staggering.

In the factory office of Mr Harry Stevens, the assistant works manager, is a library of several volumes, each containing a thorough description of all the various and sundry factory operations. There is a whole volume, for instance, describing in detail in sucessive numerical order each and every operation on a Colt Officers' Model Target Revolver. Another covers the 'S' Model which you and I know as the Woodsman .22 Long Rifle Automatic Pistol—incidentally, as sweet a little .22 as ever felt the squeeze of a hand. But let me stick to my story.

In every foreman's office are duplicates of these master factory control books, each foreman having that part which comes under his jurisdiction. Operation Number 86, for example, in the manufacture of a Government Model .45 receiver is to 'hand finish recoil spring hold, slideways, magazine opening and mainspring housing cuts.'

Believe it or not, there are some 1400 separate operations in making a Colt revolver. There are about 1200 separate operations in manufacturing a Colt automatic pistol.

Obviously it would be impossible to attempt to describe any real portion of them. Even if I tried, you would soon get



lost in a maze of technical detail. And so would I. The most I can do is to describe a few important operations such as rifling the barrel, drilling the cylinders, filing, fitting, assembling, testing, finishing, blueing... major operations that call for departments of their own.

'Fitz' guides me to one of the big machine rooms. Revolvers and automatics are not made on the same machines. The machine operations on a revolver are in charge of Timothy Trant; the machine operations of an automatic are under the supervision of Britthold Magnusson. We toss a coin to see which we'll go through. Heads it is—Trant wins.

In geometrical arrangement, hundreds of machines are spaced in this great room. Huge batteries of them stretch in rows from one side of the room to the other. Machines are grouped so that, as one operation is complete, the machine to do the following operation is right at hand. Rough and finish milling machines, for example, are side by side. It's really a beautiful sight to watch these hundreds of machines going full blast.

One is immediately aware that careful planning preceded this wonderfully efficient system. Yet such is the history of all progressive manufacturing. You or I go into a plant for the first time. What we see—the efficient layout of machinery, the efficient transportation of power to run those machines, provision made for retooling the machines—are the results of years of planning, of painstaking research, of training and experience. It is so easy and so human to accept all of it with one casual glance without stopping to realize the brains and the energy that were its conception and development.

A frame—drop forged, shot blasted, normalized and ground—comes up to the South Armory, third floor. Immediately, before a single operation is begun, each frame is carefully inspected. Thirty of them are placed on a rack. From then on, each rack goes through as a unit of production.

The first machine operation on a revolver frame is to sidemill it. Next, an especially designed machine shaves out the opening in the frame where the cylinder will eventually

DIAMONDBACK
38 SPECIAL CTG

Above: **One of Colt's fine new Diamondback revolvers. *At left:* A Strategic Air Command airman, his M16 ready, guards a B-1B bomber at Offutt AFB. *Below:* A master craftsman hand filing a revolver frame. *Below right:* The first step in producing a perfect barrel.**

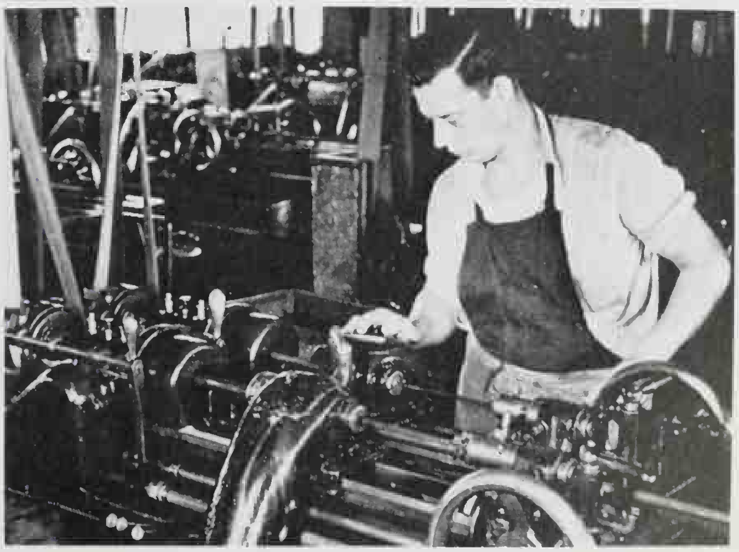
go. This is a rough operation, and the opening is next broached to finish size. A broach is a long bar of steel with a series of teeth to form cutting edges. Broaches used in the Colt factory for cutting cylinder or magazine openings will run anywhere from 30 inches to 72 inches long, each cutting tooth being larger than the one preceding and taking off so much metal per tooth, approximately .005 to .0075 of an inch. Sometimes they do 50 pairs of receivers of frames and break. Normally a broach will do a 1000 pairs before wearing out. Edges, of course, must constantly be honed and kept in the sharpest condition.

After broaching, the second side is first rough milled, then finish milled as was the first side. The frame next goes to a profiling machine. A profiling machine is to steel what a shaper is to wood-working. The cutting tool follows a pattern, milling away the metal to form the shapes desired. It is an interesting operation to watch, for one quickly sees the dropforged blank take shape. Drilling the crane hole is next. After drilling, the hole is reamed and counterbored. The operation is a fussy one, the gauge allowing a tolerance of only .001 of an inch. The barrel hole is next drilled, rough and finish reamed, counterbored, threaded and counterbored again. The frame is placed in a drill chuck again and screw and pin holes are bored. The hammer slot is cut.

The trigger hole is cut. A large hole is then cut on the side of the frame... a chunk is literally taken out. There's a lot of work to do on a revolver frame that's beneath the surface (really, inside the frame)... milling that must be done to make room for the working parts that, when the revolver is complete, are hidden underneath the side plate.

More profiling, more contour cutting... profiling for hammer and trigger, profiling inside stocks, profiling for bolt clearance, profiling the trigger guard. More drilling... firing pin hole, recess for recoil plate. And so it goes—through the 145 separate machine operations that go to make a revolver frame.

'Go' and 'No go'—that's what the gauges read. And believe me, mister, that's just what they mean. The operations must stay within these limitations or else. 'No go' means just that... a fast trip to the scrap pile. Split a hair six times, and you have some idea of the tolerances allowed in certain operations... limitations that permit a difference of only .0005 of an inch. Of course not all tolerances are as exacting as this. Some allow .001 of an inch, some .002, a few as high as .003 of an inch. That's pretty accurate, too. Remember that many parts go into a firearm, which is a



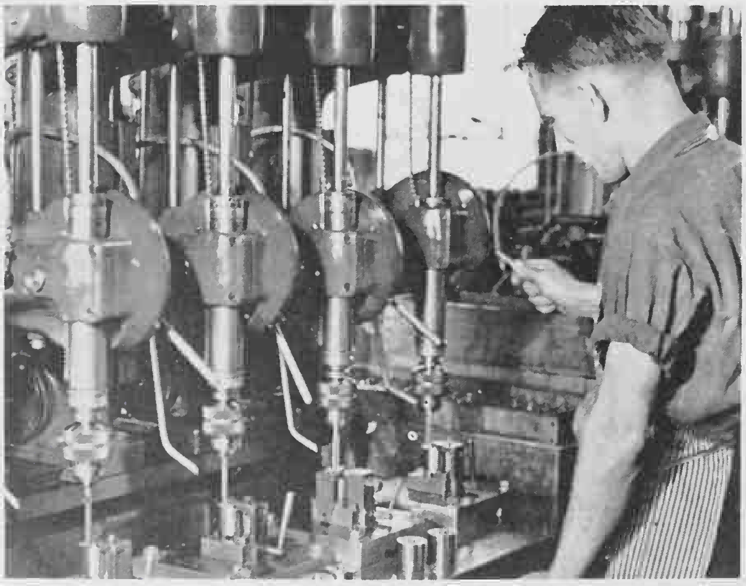
mechanism that you hold in your hand in which the problem of accuracy and precision is quite different that in building a large, heavy machine. Gauges are kept exact by frequent inspections and renewals. On the inspection bench alone, I counted 26 separate and different gauges. Yes, gauges play a leading role in the manufacture of Colt revolvers and automatics. They are the control instruments of production.

Some of the machinery at Colt is very ingenious. There is the regular run of lathes, shapers, drilling machines and etc, but scattered among the conventional machinery are a great many original machines, invented, designed and built in the Colt factory... machines that have no duplicates anywhere in the world. I saw a number of veteran machines that were built many, many years ago still in operation doing their work with efficiency and dispatch.

If you would see an interesting sight, stand on the threshold of one of the huge machine floors in a wing of the Colt factory. There you will see hundreds of machines nestled closely side by side as far as your eye can see. Noisy, yes—but a thrilling sight.

The Magic Touch Of Hands

Hand filing is a very important step in the manufacture of a Colt firearm. On a slide and receiver of an automatic pistol some 40 separate hand filing operations are necessary. On one operation alone I saw 12 different files used, varying in coarseness from one to four. Files of all kinds littered the benches. Many of them looked alike to me, but each had its purpose and each was used for that purpose. The bench jigs that have been designed to hold the various pieces to be filed are very ingenious.



Fitting a slide to a receiver so that it travels easily, yet has no side play, requires filing skill. If a slide rubs a mite, the high spot is filed down. The slide must work freely without shaking. Filing, as with every operation, is inspected and checked. Handfitted slides and receivers are matched and given serial numbers. In the inspection, the serial numbers are checked to be sure that the receiver and slide have the same numbers.

The smooth yet tight fit of the crane to the revolver frame is another filing operation that demands a masterly touch. It must swing easily, yet be snug. So is the fitting of the hammer—that it may work easily between the frame sides. Filing requires the utmost skill. Most Colt filers have been at their benches for a dozen years or more. They are aristocrats of hand work.

Gauging the height of the firing pin is an operation that demands years of experience. Another is filing the sides of the tang for grips. These must be filed so accurately that light cannot show under the center, otherwise there would be a slight rock when the grips were attached. Fittings are so tailored to each gun that once fitted, they are mated so that there can be no chance of their becoming separated. Important fittings such as cranes, side plates and hammers are individually marked by the fitter, who stamps on them his number—forever identifying his handiwork and imposing on him the responsibility of super accurate work.

Making Colt Barrels

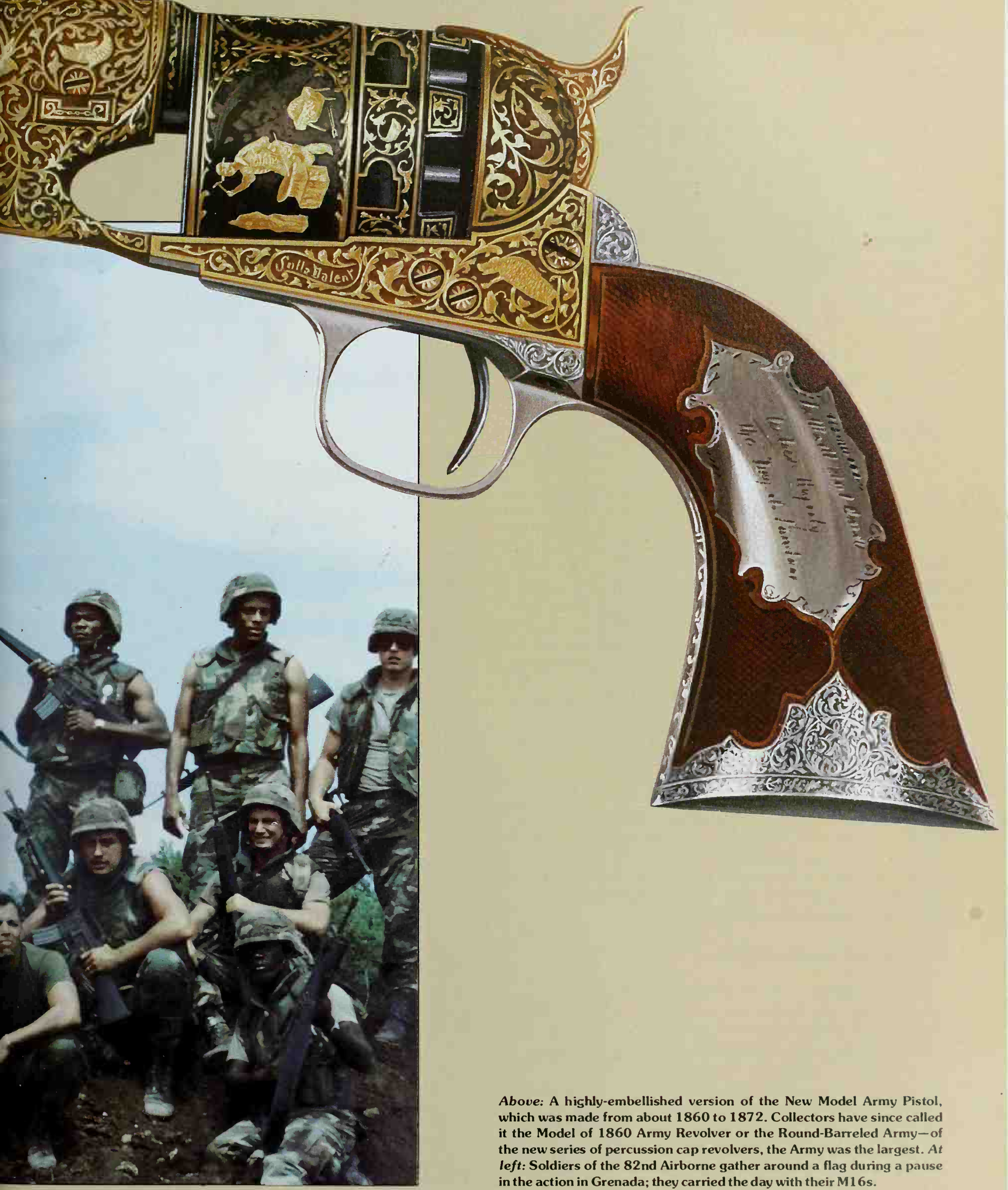
Drilling the barrel hole is a continuous process. A flow of oil of 500 pounds pressure forces the fine chips out as fast as the cutting edge takes them off. The drilling process is delicate. It takes about 10 minutes to drill a five inch barrel. One can honestly say that a Colt barrel 'gets a lot of reaming.' A barrel is machine reamed many times, each reaming making the barrel hole a thousandth or so larger.

Since every barrel tapers inside slightly toward the muzzle end, a generous amount of finish reaming is necessary. The target .38, for instance, must come within half a thousandth

Above: A soldier in basic training with his M16. At right: General George Patton with his ivory-handled Colt. In the pistol factory—counterclockwise from above left: Ensuring that the barrel lines up correctly; 'proof-testing' the barrel; and chambering the cylinder.

of the exact diameter. Sometimes it is necessary to finish ream a barrel four or five times to acquire this exactness. All along the line, I hold up to the light the barrel that is going into the gun they're building for me. Now they are putting it through the leading and polishing operation. They squirt on a drop or two of hot lead and wipe it through. The hot lead takes out any microscopic ridges and gives the inside of the barrel a high polish. We go to a rifling machine. In rifling, Colt acknowledges no superior. Inserted into the machine, the barrel is rifled. It takes about 20 minutes. Two barrels are on the same machine, each taking its turn as the cam throws the barrel over for its next cut. I hold it to the light again and see a spiral ribbon exactly .0035 deep, a lefthand twist that will spin a bullet accurately to its mark. It is a beautiful sight. No other word describes it.

A lathe turns the outside to exact dimension. The micrometer allows a tolerance of but .002 of an inch. Beyond this tolerance the barrel goes to the scrap heap. And let me say right here lest there be any doubt in your mind, there is a scrap heap at Colt's—never a big one, thanks to efficient workmen carefully supervised. But if there's the slightest doubt as to a tiny flaw or to the accuracy of a given measurement, out the piece goes right then and there. The Colt people bend over backward on this. They demand and they get perfection. A slot is cut and the front sight fitted, wound into place by a brass wire. In a subsequent brazing



Above: A highly-embellished version of the New Model Army Pistol, which was made from about 1860 to 1872. Collectors have since called it the Model of 1860 Army Revolver or the Round-Barreled Army—of the new series of percussion cap revolvers, the Army was the largest. *At left:* Soldiers of the 82nd Airborne gather around a flag during a pause in the action in Grenada; they carried the day with their M16s.

and heat treating process this wire melts in such a manner as to fix the sight as firmly as if it were part of the barrel itself.

Making The Cylinders

There are 60 separate operations on the cylinder alone. Colt cylinders originate from a solid round bar of specification steel. To the layman, this bar of steel looks like a pipe. It is fed into a wonderfully ingenious machine—an automatic machine which cuts the bar to working length. It is an old machine, built by Colt inventors and mechanics some 40 years ago, but it can be dependably counted on to do its work with accuracy that must have been marvelled at at the time the machine was made. The center hole is bored, first rough bored, finish bored, then reamed three times. It must be accurate to .0005 of an inch. Inspectors look each cylinder over to detect any possible flaw in the steel. It is then ground to finish diameter, the diameter gauge allowing a tolerance of less than .002 of an inch. It is then gauged for trueness of diameter, the gauging showing up any slight eccentricity that might have occurred should any particles of dirt have crept into the arbor upon which the cylinder is held while being ground.

Drilling The Chambers

A lathe operation next cuts the cylinder to exact length. Into a drill jig it goes and the six holes are spotted. The bores of the cylinder are drilled half way through from the rear. Then the bores are drilled from the front to complete the process. There is a difference of .0012 between the front and rear ends of the chamber bores. The bores are reamed, first by a boring reamer, then by hand. A milling machine then makes the lightening cuts—the sleeve-like semi-round cuts that you see on the outside of your cylinder at the front end—so-called because their sole purpose is to take out unnecessary weight. Lead cuts are then made to facilitate travel. A coupling is doweled into position. A ratchet rod and ratchet are assembled to the cylinder, and two dowel pins inserted to hold the ratchet in correct and permanent position.

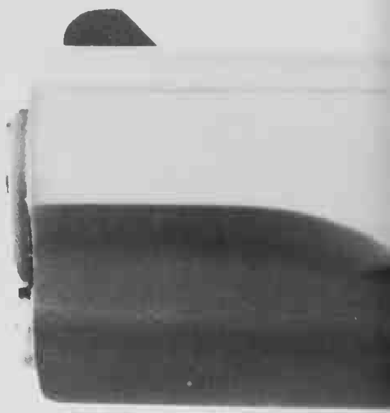
Practically all that remains to complete the cylinder is the fine reaming of the chamber bores. And when I say 'fine reaming,' that is just what I mean. There is no finer industrial reaming done anywhere in the country. The gauges allow no tolerances whatever. Measurements must be held exact to size. Cylinders, all machine operations complete, are sent to the heat treating room for heat treating.

All Colt cylinders turn right: this motion holds the crane tightly against the frame, keeping the chamber and barrel in perfect alignment for every shot.

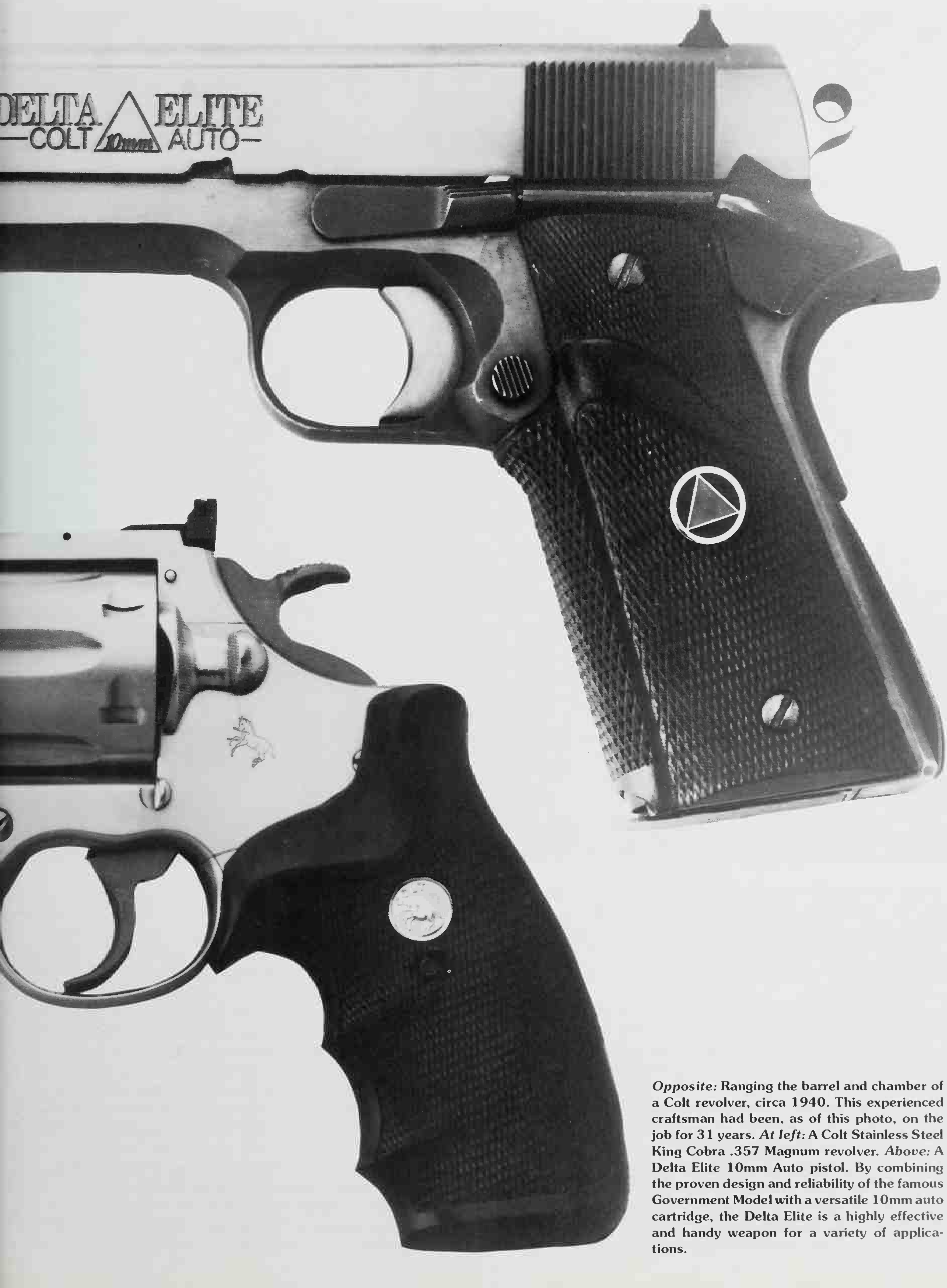
Fitting And Assembling

From machines to hand filing, to finishing, blueing, assembly, targeting, inspection and finally to stock, is the itinerary of a Colt revolver. Minor machine operations are done en route such as chamfering edges of hammer and trigger slots, gauging fitting stops so that the cylinder will not swing out too far, cutting the safety latch slot and cutting threads inside the frame barrel hole to exact gauge depth and tapering them.

Fitting the cylinder to the frame is an operation assigned only to an expert. Fine files and emery grit are his tools. One man has been fitting cylinders for over 25 years. That has



KING COBRA
MAGNUM CARTRIDGE



Opposite: Ranging the barrel and chamber of a Colt revolver, circa 1940. This experienced craftsman had been, as of this photo, on the job for 31 years. *At left:* A Colt Stainless Steel King Cobra .357 Magnum revolver. *Above:* A Delta Elite 10mm Auto pistol. By combining the proven design and reliability of the famous Government Model with a versatile 10mm auto cartridge, the Delta Elite is a highly effective and handy weapon for a variety of applications.

COLT MK IV
SERIES 80

Above, from bottom: **Stainless steel Officer's ACP; blue Combat Commander; and stainless steel Government Model.** ***At right, from bottom:*** **A King Cobra, with short hammer throw for quicker lock time; a Colt Peacekeeper for police work; and the much-renowned Python.**

been his one job—nothing else. He has never worked in any other department.

Facing the barrel hole is exacting to the nth degree. No tolerances are allowed. When the barrel is fitted to the revolver frame, it must screw up tight and when it is tight, the front sight must be perfectly true on top of the barrel.

Probably no single operation in the assembly of a Colt revolver is gauged and inspected more rigidly and more often than ranging or aligning the chamber bores with the barrel. Before it goes to the shooting gallery, the firearm is ranged. It is ranged again after it is returned, and again in the final inspection. Not only that, but the gauging and the inspection work are rechecked by a second inspection. The perfect alignment of cylinder and barrel of every Colt revolver is a demand, a 'must' and a creed. As some indication of the precision employed in ranging, the maximum wear allowable of the range gauges is .0005 of an inch—or the thickness of a human hair split six times.

Polishing Steel To a Mirror-Like Finish

Some idea of the ultra skill employed in the polishing process may be gleaned from the fact that polishers coming to Colt who have worked elsewhere have to go through a training school. Though experts before, they actually are not good enough to do the fine work that Colt demands. Some of the polishing operations, particularly those involving flat surfaces, are so exacting that 98 out of 100 polishers cannot do the work.

The polishing room is literally a room of wheels—wheels and sparks. These wheels are of all types—flat wheels, form wheels, contour wheels—each designed and suited to a certain polishing operation. The actual polishing of a revolver or an automatic is but a fraction of the total time and cost in-

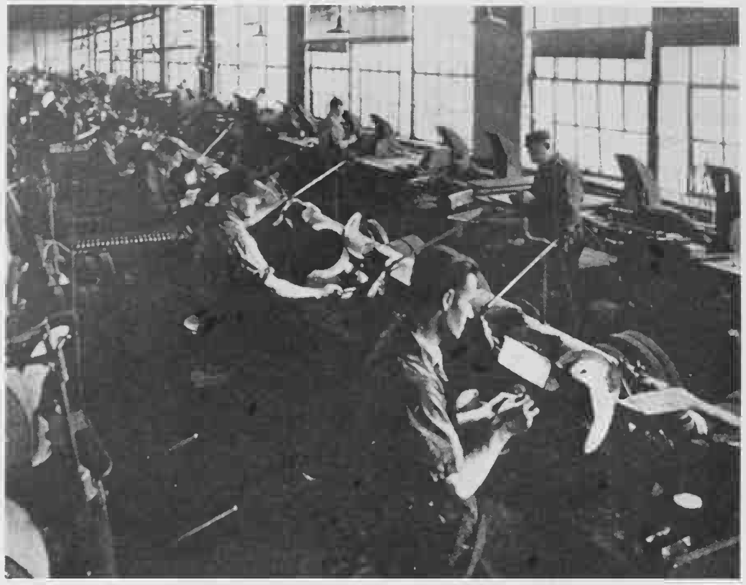
volved. The preparatory work is enormous—keeping the different polishing wheels in order, resetting them with fresh abrasive, breaking new wheels in—all this is preparatory to the actual polishing of the steel. When you stop to consider that practically every Colt model requires a different set of wheels, you begin to understand what I mean when I say the polishing room is a room of wheels. It is mighty interesting to watch how a polishing wheel is reset. A polishing wheel is made of wood and formed to carefully fit the surface it is going to polish. The rim of the wheel is covered with leather. New leather is given a coating of beef tallow and Japanese wax melted together in secret combinations to gain required texture. Most of the leather is imported: American hides, particularly of late, have not been thick enough to stand the gaff. The leather covered wheels are given a thorough bath and are dipped in hot glue. The rim is then rolled in loose abrasive, the coarseness of which is determined by the job assigned each wheel. The new wheels must then be broken in.

From polishing, we go downstairs to the blueing room.

Moisture is the great enemy of the blueing room. With the care that a hospital operation room fights bacteria, so does the Colt blueing room fight moisture. Nothing is overlooked to constantly guard the surfaces of steel against damaging moisture.

Frames, cylinders, barrels, slides, receivers and parts come to the blueing room direct from the polishing department. Side plates and craned are removed. Everything is first given a bath in hot gasoline… gasoline heated to 150 degrees Fahrenheit. This removes all dirt particles, dust or grease that may have gathered on the way down from the polishing room. Hot air is then forced over them to eliminate all presence of moisture, the arch enemy.

After washing and drying, the side plates (in the case of revolvers) are put back on. But they are put on with 'work screws' that hide beneath the surface so that the entire surface can be completely exposed for cleaning and blueing. When finished, blued screws will replace the work screws.



Scenes from the 1940s—*counterclockwise from top:* Large and small parts are polished to a mirror-like finish here in the Polishing Room; two polishers at work; and loading a rack of revolver frames into a blueing furnace. *Above right:* The Colt Detective Special.

DETECTIVE SPEC.
.38 SPECIAL CTG.

All surfaces to be blued are then wiped with a solution of alcohol and whiting—a polishing compound of very fine texture. Wiped with a soft dry cloth, the parts are now chemically clean. From this point on until the blueing process is complete, not a human hand touches a surface to be blued. All this is preparatory to the actual blueing process itself.

A blueing run starts the first thing in the morning. A secret mixture of charred bone and primer is put into the blueing furnaces. The furnaces slowly revolve. Pyrometers control furnace heat. Readings are taken every 15 minutes during the five hours it takes to complete the blueing process, which reaches a high temperature of 650 degrees.

The furnaces are gas fired. Four burners supply the heat in each one, and it is interesting to note that the forward burner is larger to compensate for any heat loss through the doors.

The 'charge' used in the blueing process is ground animal bone charred to chemical purity in a bone pot placed into a white hot furnace at 1400 degrees. Two hundred pounds of bone are charred at a time, burning away all foreign matter.

The 'primer' is bone, soaked in pure petroleum oil. Even the oil is boiled to remove moisture and foreign matter: it must be chemically pure. The primer is what gives off the smoke that keeps free oxygen away from the pieces being blued in the revolving drums. The 'primer' and 'charge' are mixed and put into the furnace before the work goes in.

What is the chemistry of blueing anyway? How does this blueing process impart the handsome and lasting blued steel finish so famous in modern firearms? Blueing is a combination of carbonizing and oxidizing, which, with heat brings the inherent carbon of the steel through the open pores to the surface: all the coloring is done by heat. No particle of bone ever touches the parts being blued—the smoke given off by the 'primer' expels free oxygen from the drum, leaving only sufficient oxygen to allow combustion. The primer and the charge control the composition of gas in the furnace; the heavy carbon dioxide shielding the parts from contact with oxygen. All this calls for expert knowledge and experience in mixing the proper proportions of the primer and charge—not only to obtain the proper color, but to create a smoke that is free from moisture. Otherwise—though blued, the pieces would be pitted.

When you buy a Colt revolver or automatic with full blued finish, a full blued finish is what you get. Even the inside of your barrel is blued. And there is something beautiful about blued steel that even an artist of words could hardly describe.

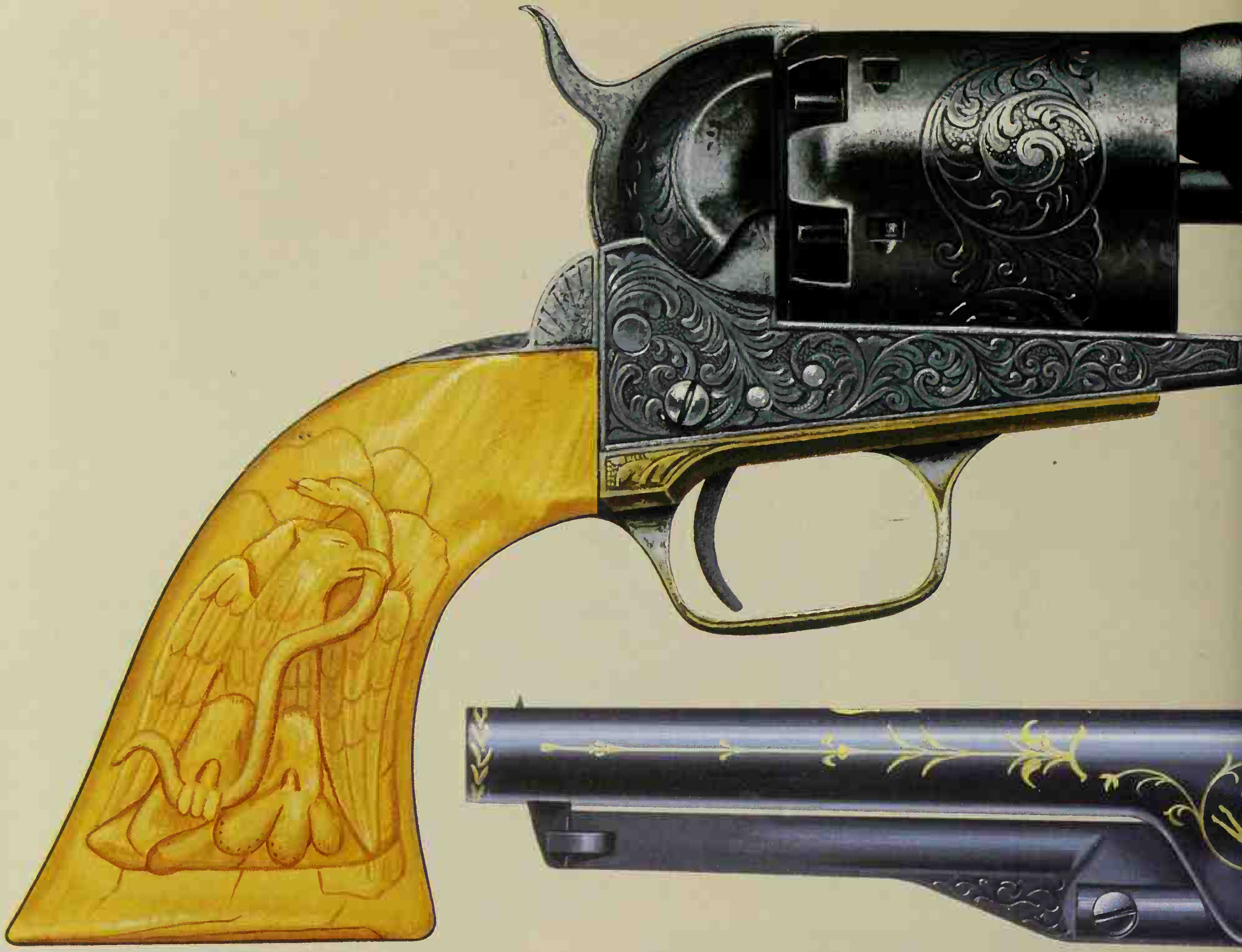
Over a hundred fabricating hammers a week are used in manufacturing Colt revolvers and automatic pistols. You must wonder how hammers could wear out so quickly. But these are not ordinary hammers. They are lead hammers and are used because lead is softer than steel and therefore can do it no harm. In filing, fitting and assembling it is often necessary to slightly tap the frame with a hammer in order to loosen a side plate or a crane fitting that fits too tightly—for which lead hammers are used. Incidentally, they are made right in the Colt factory—thousands of them. Using lead hammers is just another way with which Colt 'Care-On-Little-Things' is expressed.

All the parts that go into the manufacture of a Colt revolver or automatic—even the incidental ones like the stocks,

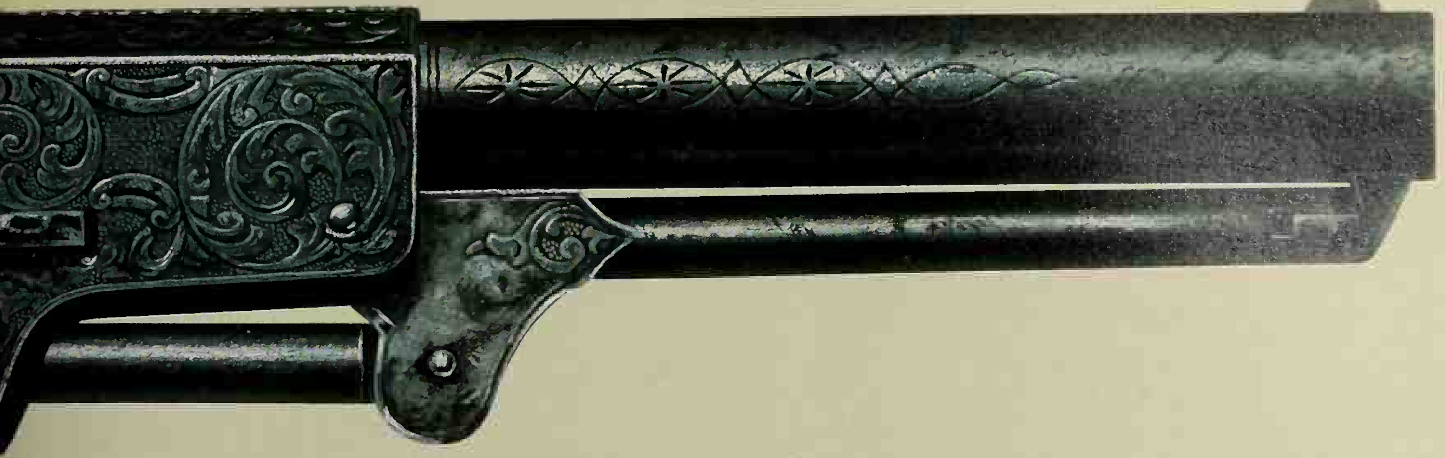
the springs, screws and etc—are made right in the Colt plant.

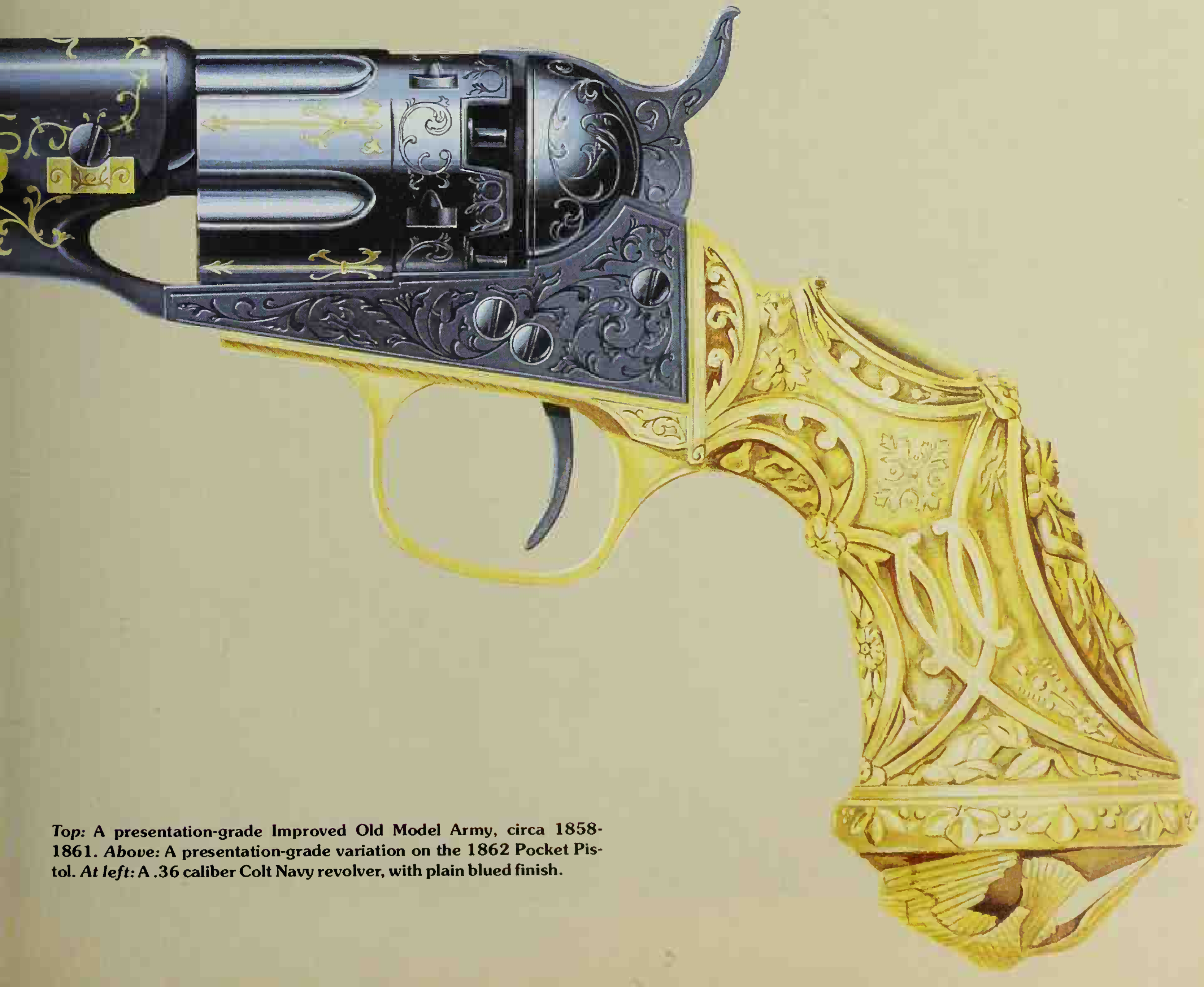
There is a well equipped woodworking shop in which the grips are turned out. Colt grips are made from selected walnut. The actual shaping of a pair of Colt grips is pretty much a matter of conventional wood turning. Finishing them, however, is a horse of another color (no Colt pun intended). The filing, sandpapering and hand finishing require patience that only those who are satisfied with nothing less than best possess. Perhaps the most outstanding machine in this department is the checkering machine. I was thrilled watching this ingenious automatic machine that, with mathematical precision, cuts the tiny but deep grooves that result in checkered grips. Shooters all agree that beautifully deep checkered stocks add security to the grip... essential to firing line confidence.

The proper and dependable action of the firing mechanism's springs constitutes an important function in the operation of a firearm. In the automatic, of course, there are the main spring, the recoil spring and the firing pin spring. Springs in a revolver include the bolt spring, latch spring and ejector rod spring. You might naturally think that

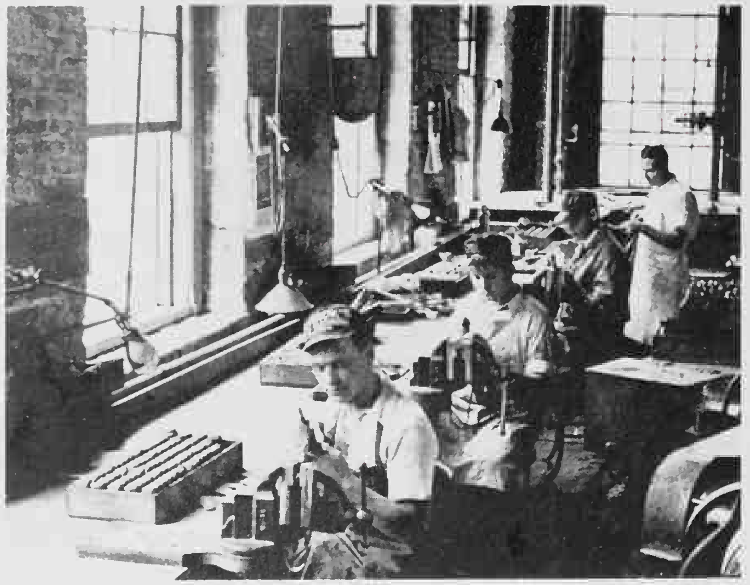


10
4





Top: A presentation-grade Improved Old Model Army, circa 1858-1861. *Above:* A presentation-grade variation on the 1862 Pocket Pistol. *At left:* A .36 caliber Colt Navy revolver, with plain blued finish.



Above: **Hand checkering pistol stocks in the mid-20th century.** ***Below:*** **Note the tools that this assembler used to fit and adjust parts into a finished pistol.** ***At right:*** **John Wayne and Joanna Barnes look on as Kirk Douglas extols his Peacemaker in the movie** ***The War Wagon*****.**

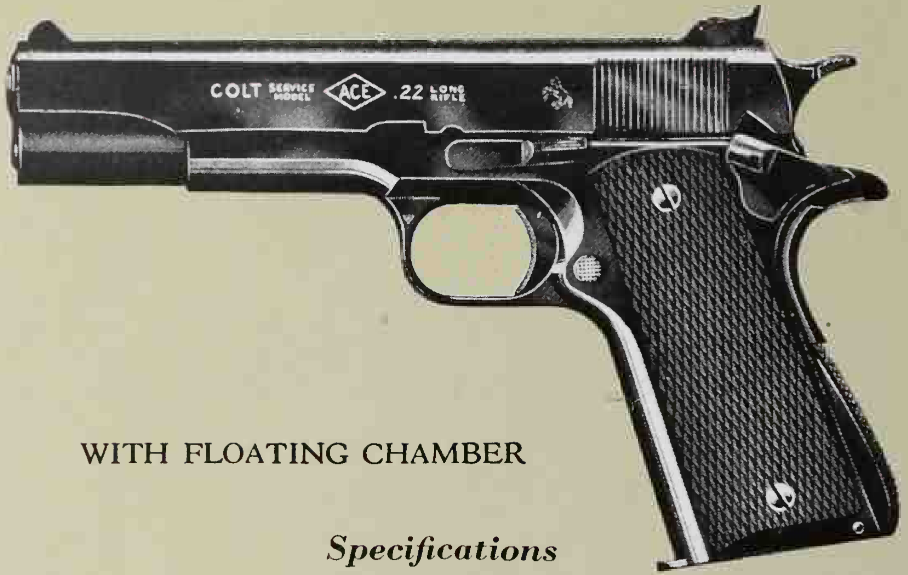
the Colt company would purchase its springs, but they do not—they make them themselves. The quality of springs that Colt demands is not obtainable anywhere in the country. Years ago Colt's engineers designed and built machines to make springs to the specifications desired. Occasional efforts have been made since that time to determine whether the same specifications could not be met outside the plant, but to date no manufacturer of springs can be found who will meet Colt demands.

First of all, triple A wire is used. The dimensions of the wire must be exact, the number of coils to a given length must be exact, the wright must be exact, and all these specifications must tally after the springs are heat treated to specified temper. A spring is ordinarily just a few coils of wire, but with Colt it is a major part to be fussed over until it's exactly right and unvaryingly efficient.

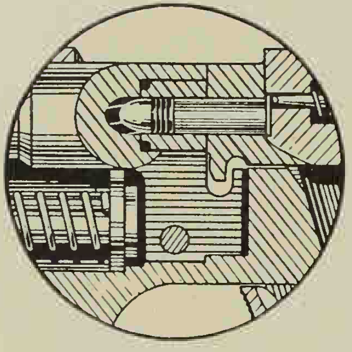
When the gun has been built, assembled and tested, only one more thing is necessary and then the gun is ready to go to the shipping room as a full fledged Colt. That one thing is inspection—inspection with a capital 'I.' From the shooting gallery, their testor-signed targets accompanying them, Colt firearms go to the inspection room where a veteran of long

Colt "Service Model Ace" Automatic Pistol

CALIBER:
.22 Long Rifle
(Both Regular and High Speed Ammunition)



WITH FLOATING CHAMBER



New Floating Chamber Increases Recoil Approximately Four Times

A feature of the Service Ace is its ingenious "floating chamber" which amplifies the ordinary recoil of a .22 four times, and provides positive functioning under all conditions.

The floating chamber is a marvel of simplicity . . . consisting of a movable chamber, so designed as to increase pressure, building up the recoil until it simulates the recoil of the .45 caliber automatic pistol. The Service ACE is a natural for military shooters, a remarkably fine training gun for beginners.

Specifications

CAPACITY OF MAGAZINE: 10 cartridges.

LENGTH OF BARREL: 5 inches.

LENGTH OVER ALL: 8½ inches.

ACTION: Hand finished.

WEIGHT: 42 ounces.

STOCKS: Checked Walnut.

TRIGGER AND HAMMER SPUR: Checked.

FINISH: Full Blued.

SIGHTS: Ramp front sight, fixed. Rear sight adjustable for both elevation and windage. Both stippled.

ARCHED HOUSING:Checked.

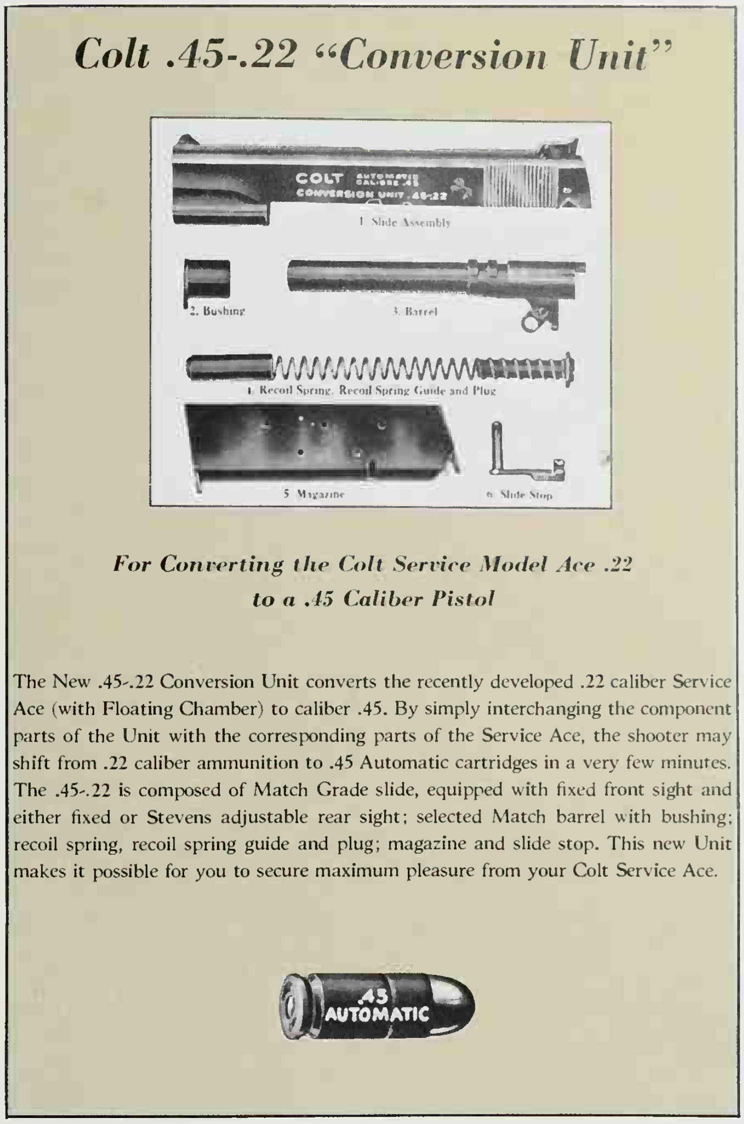
The New Service Model Ace has been designed to provide efficient and economical target practice for military men, and all shooters of the heavy frame Colt Automatic Pistols. It is similar in design to the regular Ace Model . . . plus the recently perfected Floating Chamber. By the use of the Floating Chamber the recoil has been increased four times, simulating the recoil found in the .45 caliber Government Model Automatic Pistol. Thus the shooter is trained with an arm that allows him to later change to the heavier caliber pistol, without the additional recoil being noticeable. Because of the much lower cost of .22 caliber ammunition the Service Ace will pay for itself in a very short time.

Special Features

Except for difference in caliber, the new SERVICE MODEL ACE and the Government Model .45 are practically twins. They are so near alike that you can switch from one to the other and hardly notice the difference. However, the Service Ace is provided with hand finished action and a two-way Stevens adjustable rear sight. The front sight is fixed with serrated face.

.22
LONG RIFLE

The Service Ace saves *real* money and pays for itself in a very short time. It provides accurate, economical target shooting for Service men — members of National Guard, Reserve Officers, and individual shooters of the .45 Caliber Automatic Pistol . . . at one-seventh the cost of .45 automatic cartridges.



Colt .45-.22 "Conversion Unit"

COLT AUTOMATIC CALIBRE .45
CONVERSION UNIT .45-22
1 Slide Assembly
2. Bushing
3. Barrel
4. Recoil Spring, Recoil Spring Guide and Plug
5 Magazine
6 Slide Stop
.45 AUTOMATIC

For Converting the Colt Service Model Ace .22 to a .45 Caliber Pistol

The New .45-.22 Conversion Unit converts the recently developed .22 caliber Service Ace (with Floating Chamber) to caliber .45. By simply interchanging the component parts of the Unit with the corresponding parts of the Service Ace, the shooter may shift from .22 caliber ammunition to .45 Automatic cartridges in a very few minutes. The .45-.22 is composed of Match Grade slide, equipped with fixed front sight and either fixed or Stevens adjustable rear sight; selected Match barrel with bushing; recoil spring, recoil spring guide and plug; magazine and slide stop. This new Unit makes it possible for you to secure maximum pleasure from your Colt Service Ace.

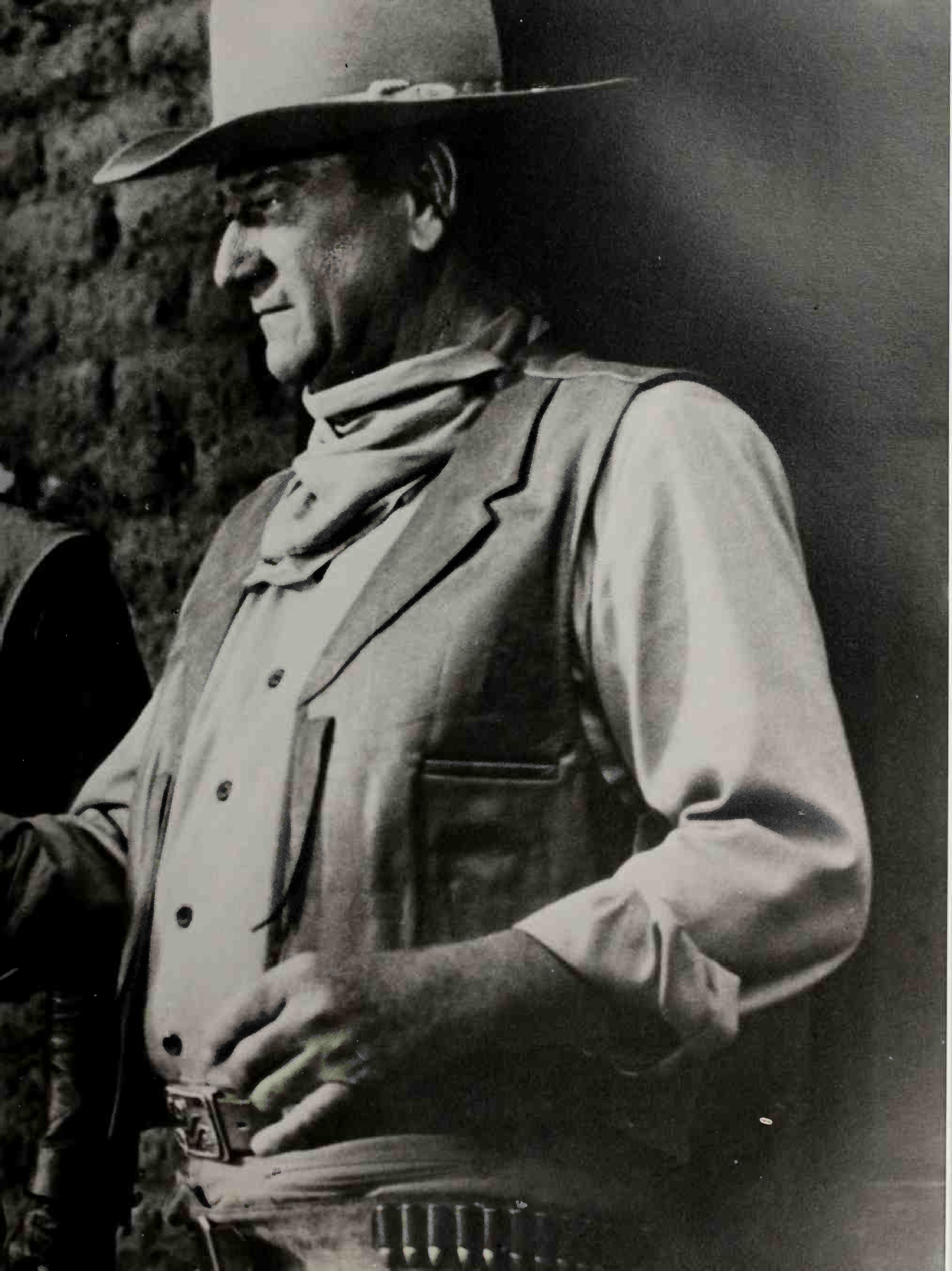
years goes over them 'with a fine-toothed comb.' He looks them over thoroughly, gauges certain fittings, ranges them again, checks action and trigger pull, and literally mothers them like they were lost orphans. If they pass final inspection and 9/10ths of them will, they are put into stock in the shipping room, wrapped in soft tissue and boxed. A Colt has to earn its VP—the 'Verified Proof' mark. This is truly a badge of perfection which the final inspectors strike on to the metal after they have given a firearm a 'clean bill of health' to go out into the world and uphold the Colt reputation for building the world's finest hand guns. But a Colt has to earn it—it must pass every test, every inspection by a good margin or else the VP does not go on. The VP mark is held in high honor by Colt workmen. They know, better than anyone else, that when a firearm finally gets its VP it is a true Colt—a thoroughbred.

The thing that impressed me perhaps more than any other single thing in my whole trip through the mammoth Colt plant is the absolute and utter care given to the manufacture of a Colt revolver or automatic pistol. I have seen precision manufacturing before. But never, never have I seen so many—and so minute—gaugings, inspections, re-gaugings and tests put into the manufacture of a single product.

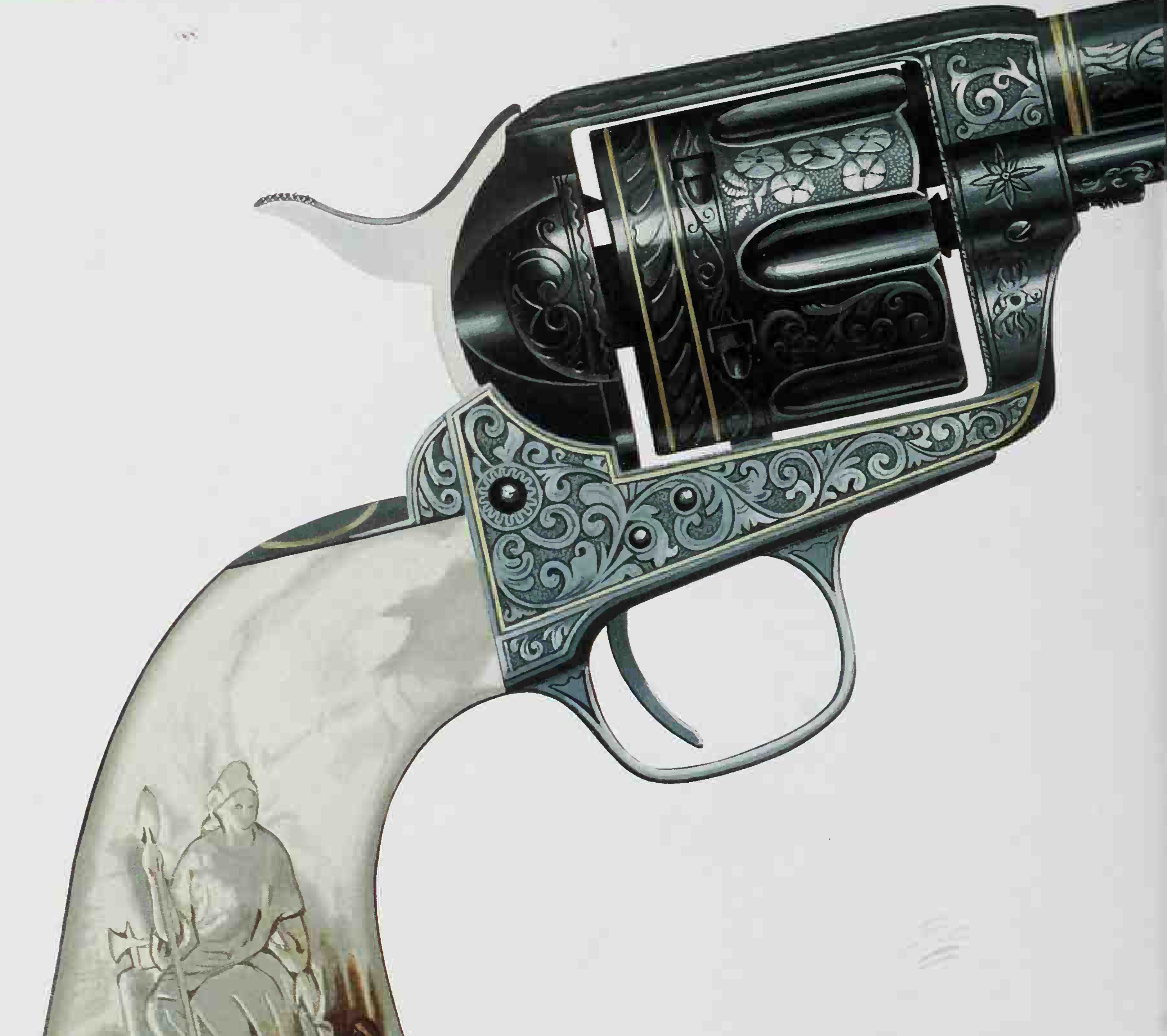
Not only is meticulous care given to each machine operation, but the deliberate and unhurried hand fittings, the skilled benchwork, is of a character that one might easily and truthfully associate with only the great guilds of medieval craftsmen. Craftsmanship, skill and practical knowledge born only of experience is the important human tool that builds a Colt revolver. Gauges catch any faulty mechanical operation, but the human eye, the human hand and long years of experience are the factors that account for the unchallenged accuracy, the smoothness of operation and the absolute dependability of a Colt.

In my desire to emphasize the skill of the old school I must not give you the impression that the Colt factory is run by old men—by no means: rubbing elbows with these older gentlemen are youthful, keen-eyed, stalwart young men ambitious to carry on the spirit and traditions of each of their crafts. On my travels through the Colt factory, occasionally losing my own bearings in their 50-odd acres of floor space, I made it a particular observation to note in my mind how the problem of developing apprentices was being met. I was deeply impressed with the type of young men serving the plant and the seriousness with which they accept the responsibility of their separate functions. Craftsmanship is in their blood.

***Opposite and above:* Ads from Colt's 1940 catalogue. *Left:* Checking a revolver in Colt's Final Inspection Room. *Above left:* Testing Officers' Models in the Shooting Gallery. *Overleaf:* In the Old West, you always had to be prepared—John Wayne and Kirk Douglas test their Colts in one of the many films in which Mr Wayne and Mr Douglas starred.**



Excellence



Above: A rather fancy Single Action Army revolver. The first large revolver for metallic cartridges that was sold by Colt, it was first named the New Model Army Metallic Cartridge Revolving Pistol and is also called the 'Peacemaker' and the 'Frontier Six-Shooter'and has very often been referred to as 'legendary.'

and Art

In the realm of firearms hand engraving, the words 'custom' and 'factory' have similar but distinctive meanings. Custom engraving is the product of a special and specific request by the client to decorate a gun with certain selected patterns and, in some cases, the use of precious metals. Factory engraving is done in more traditional and standardized styles of engraving. Journeymen engravers work on this type of project, whereas the master engravers are assigned the custom work.

Pricing for engraving is generally made on the basis of how much of the firearm is covered with the artwork. Letters of the alphabet denominate this coverage factor. 'A' is one-quarter coverage, 'B' is one-half coverage, 'C' is three-quarters coverage, and 'D' is full coverage.

The Colt Custom Gun Shop performs special services to enhance most Colt products cosmetically and functionally. The time-honored Colt Single Action Army revolver is produced and sold in limited quantities exclusively by the Colt Custom Shop, for sale to collectors of fine firearms. The Custom Shop produced several unique Single Action variations for 1986. These models used the old style black-powder frame design that featured a base pin screw, a round ejector rod head, a three-line patent date rollmark on the frame, an Italic rollmark on the barrel and caliber stamp under the barrel on the .44-40 caliber model.

Colt offers its custom services on all current firearms featured in the standard commercial products catalog, and will consider work on older Colt models—on a case-by-case basis (depending upon availability of replacement parts).

The Custom Gun Shop has historically supplied collectors of fine art with hand engraved firearms of premium quality. Production firearms are enhanced through the time-honored craft of embellishing metal, utilizing the hands of Colt's world-renowned master engravers. Colt engravers handcarve traditional engraving patterns, and inlay both flush and raised reliefs with precious metals to enhance the appearance and worth of firearms submitted to their care. The engravers provide five different scroll patterns: Classic American, (and, upon special request) Oakleaf, Vine, English or Nimschke styles of engraving. Colt master engraving provides the finest balance and detail available today. In addition, each piece is individually signed by the master engraver—and this has historically contributed to greater desirability and value. Additionally, master-engraved firearms can be documented in detail on Colt letterhead by the Colt Historian.

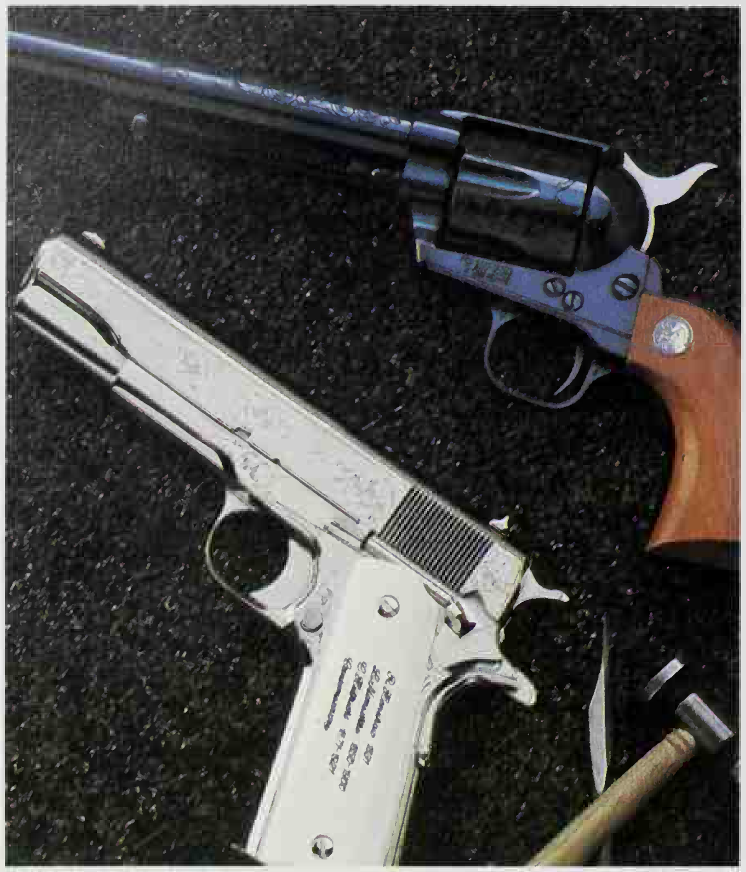
Custom engraving pricing is based on the amount of coverage desired, complexity of style and time required for special requests. The engraving pattern will be designed and quoted by experienced Custom Shop personnel, who can offer the collector valuable insight into the design of a personalized firearm. These truly unique Colts can currently be created in less than a year.

The Custom Shop offers hand engraving performed by journeyman engravers that complements any Colt firearm. Engraving may be special ordered to highlight individual parts of the firearm. The four basic decoration areas of the Single Action Army are the barrel, the cylinder, the frame and the trigger guard/backstrap. Colt hand engraving designs, based on a variation of the American style, are chosen by the engraver. Coverage on other Colt models is consistent with their four traditional coverages, unless a specific quotation is requested. The Colt Custom Gun Shop can deliver these types of orders currently in less than six months.

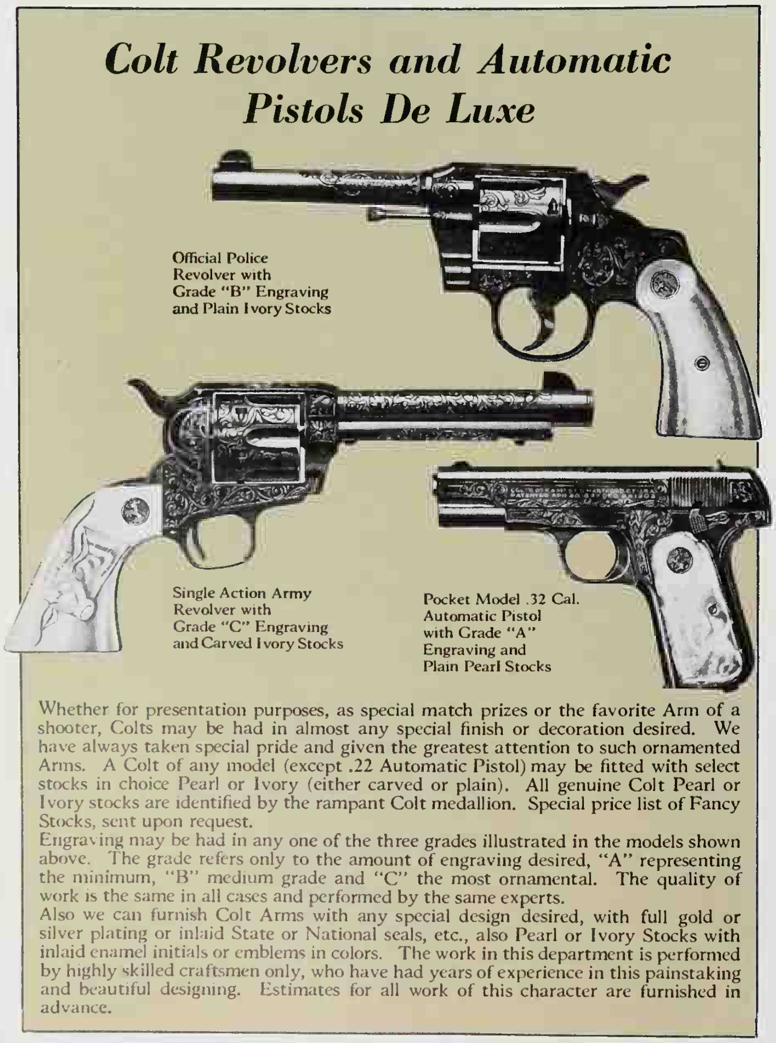
The Custom Gun Shop accepts requests for limited production (minimum of 50 firearms) Colt firearms. This is ideal for organizations who wish to incorporate mottos, dates and pictures into artwork of their customized firearm. Anniversary, celebration and fund raiser commemorative edition firearms for fraternal, civic, military and law enforcement groups have been successfully created by Colt. The Custom Shop selectively plates guns in gold or silver with the finest detail offered in the industry today, and can hand

Opposite: Colt's 150th Anniversary Exhibition Gun, based on the 'Peacemaker' of Wild West fame. Grip engravings feature the young Sam Colt whittling the prototype from which the modern revolver would evolve, a head portrait of Colt on the receiver flange, Colt's 'rampant colt' logo on the cylinder, and portraits of the Python Ultimate revolver and Officer's ACP on the barrel. *Top:* The grips butt of the 150th Anniversary Gun. *Above left and right:* A 'flip side' view of its receiver with engravings.

150th Anniversary Model
Colt 150
1836-1986
PAT. SEPT. 19. 1871
" JULY 2. 72
" JAN. 19. 75



Above left and right: **Samples from the Colt Custom Shop—inlays, motifs and scroll styles.** ***Below:*** **An ad for Colt ornamentation in 1940.** ***Opposite:*** **A historical letter from the Colt Historian, tracing the history of a collector's Colt by means of factory records.**



Colt Revolvers and Automatic Pistols De Luxe

Official Police
Revolver with
Grade "B" Engraving
and Plain Ivory Stocks

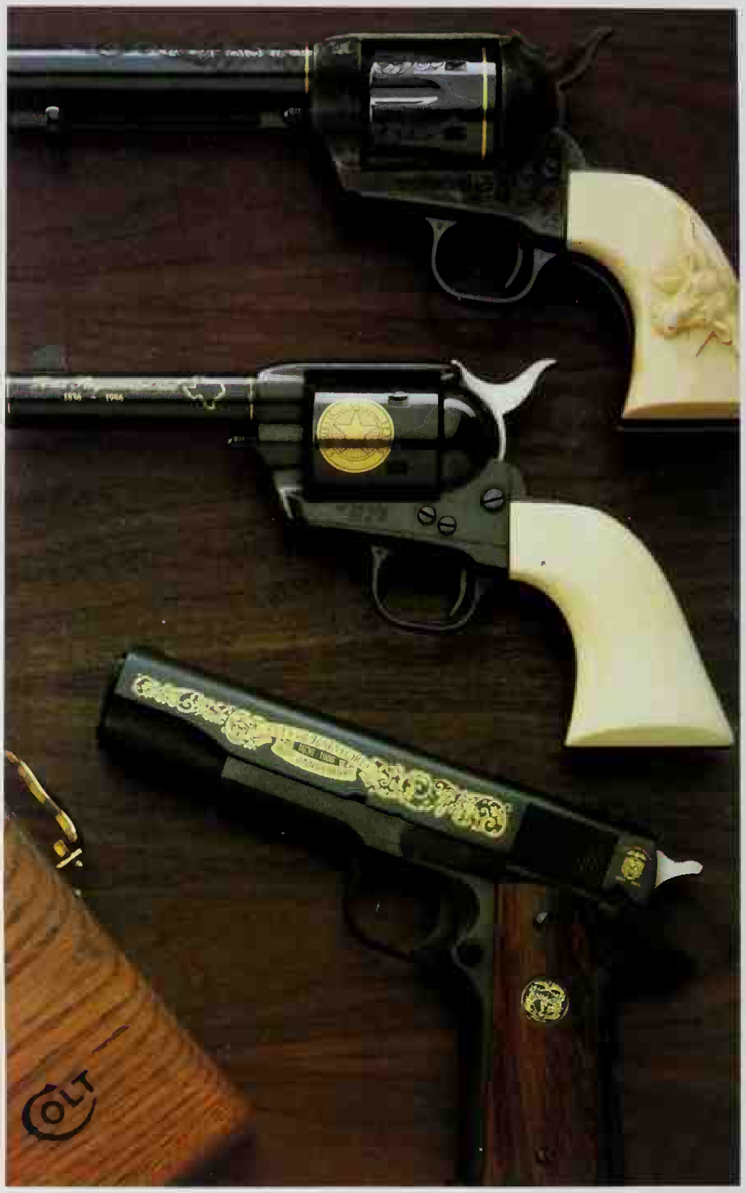
Single Action Army
Revolver with
Grade "C" Engraving
and Carved Ivory Stocks

Pocket Model .32 Cal.
Automatic Pistol
with Grade "A"
Engraving and
Plain Pearl Stocks

Whether for presentation purposes, as special match prizes or the favorite Arm of a shooter, Colts may be had in almost any special finish or decoration desired. We have always taken special pride and given the greatest attention to such ornamented Arms. A Colt of any model (except .22 Automatic Pistol) may be fitted with select stocks in choice Pearl or Ivory (either carved or plain). All genuine Colt Pearl or Ivory stocks are identified by the rampant Colt medallion. Special price list of Fancy Stocks, sent upon request.

Engraving may be had in any one of the three grades illustrated in the models shown above. The grade refers only to the amount of engraving desired, "A" representing the minimum, "B" medium grade and "C" the most ornamental. The quality of work is the same in all cases and performed by the same experts.

Also we can furnish Colt Arms with any special design desired, with full gold or silver plating or inlaid State or National seals, etc., also Pearl or Ivory Stocks with inlaid enamel initials or emblems in colors. The work in this department is performed by highly skilled craftsmen only, who have had years of experience in this painstaking and beautiful designing. Estimates for all work of this character are furnished in advance.

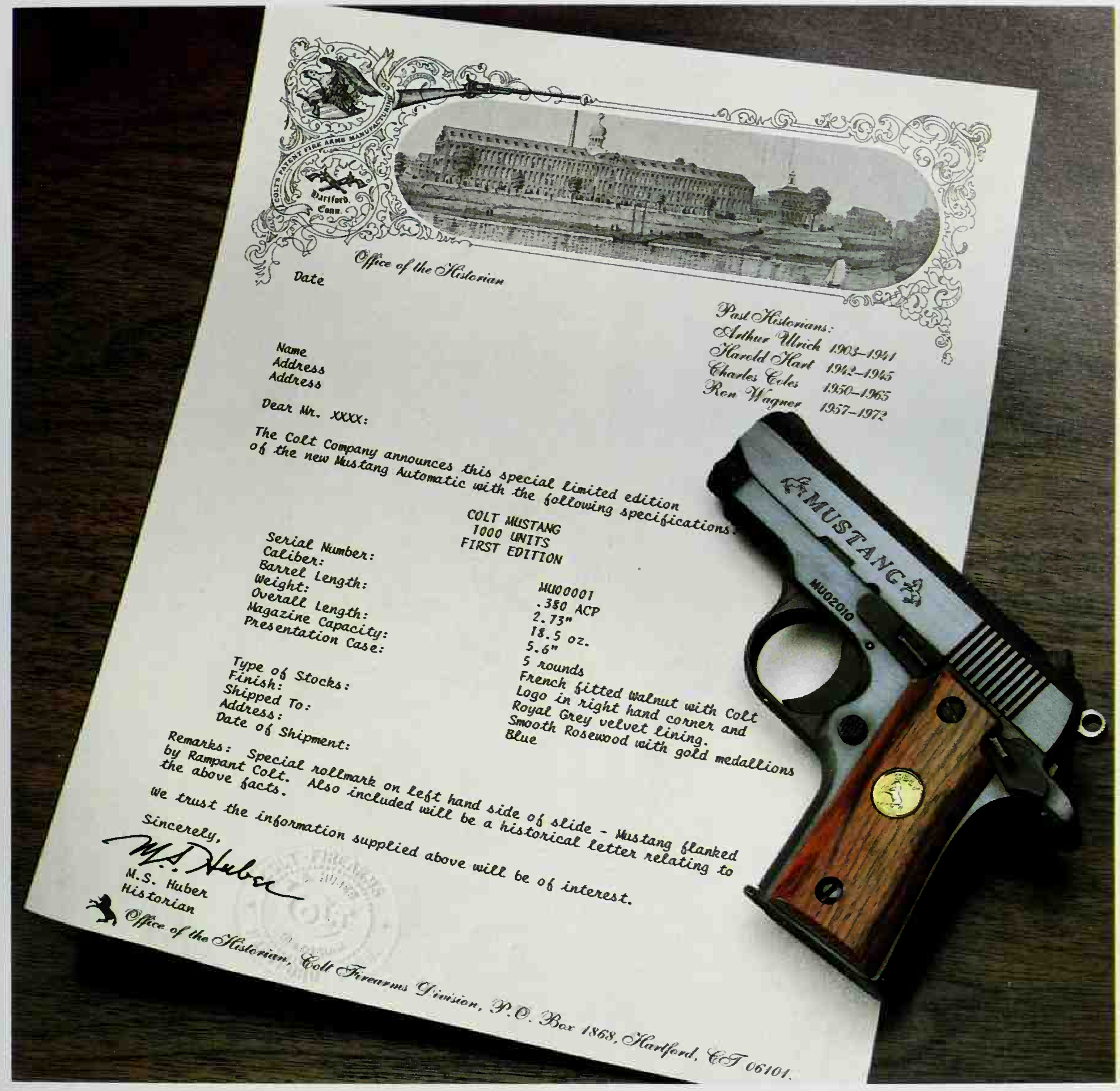


engrave to the specifications of individuals or organizations, polish to presentation grade cosmetic standards and fit guns with unique stocks and stock decorations. Customers may design cosmetic or functional features to create a unique variation on current Colt model offerings and the Custom Shop will fabricate their designs. Unique presentation packaging can be ordered to complement and protect the 'customized' firearms.

The Custom Shop polishers have prided themselves on attention to detail and the quality of finish that is evident in Colt Royal Blue and special plated firearms. The 'Mirror Brite' finish imparts an ultra buffed sheen to all exterior parts of the firearm. Great attention is paid to highlighting surfaces, which results in firearms of high polishing standards.

Colt firearms may be refinished in blue, blue and color case, Colt Guard, Royal Blue and nickel. Prices will vary depending on the model and condition of firearms. All modern firearms returned for refinishing are cleaned, given minor adjustments and test fired.

The Custom Gun Shop can enhance the presentation of any Colt firearm with a select wood presentation case. These fine cases, crafted from oak, cherry or walnut are available with 'French fit'—partitioned interiors of rich velvet. Custom etched or engraved plates may be ordered to further enrich the presentation of guns produced for special awards, retirements, anniversaries or birthdays. All custom


Colt's Patent Fire Arms Manufacturing
Hartford, Conn.
MUSTANG
MU02010

Office of the Historian

Date

Past Historians:
Arthur Ulrich 1903–1941
Harold Hart 1942–1945
Charles Coles 1950–1965
Ron Wagner 1957–1972

Name
Address
Address

Dear Mr. XXXX:

The Colt Company announces this special limited edition of the new Mustang Automatic with the following specifications:

COLT MUSTANG
1000 UNITS
FIRST EDITION

Serial Number:	MU00001
Caliber:	.380 ACP
Barrel Length:	2.73"
Weight:	18.5 oz.
Overall Length:	5.6"
Magazine Capacity:	5 rounds
Presentation Case:	French fitted Walnut with Colt Logo in right hand corner and Royal Grey velvet lining.
Type of Stocks:	Smooth Rosewood with gold medallions
Finish:	Blue
Shipped To:	
Address:	
Date of Shipment:	

Remarks: Special rollmark on left hand side of slide - Mustang flanked by Rampant Colt. Also included will be a historical letter relating to the above facts.

We trust the information supplied above will be of interest.

Sincerely,

M.S. Huber

M.S. Huber
Historian

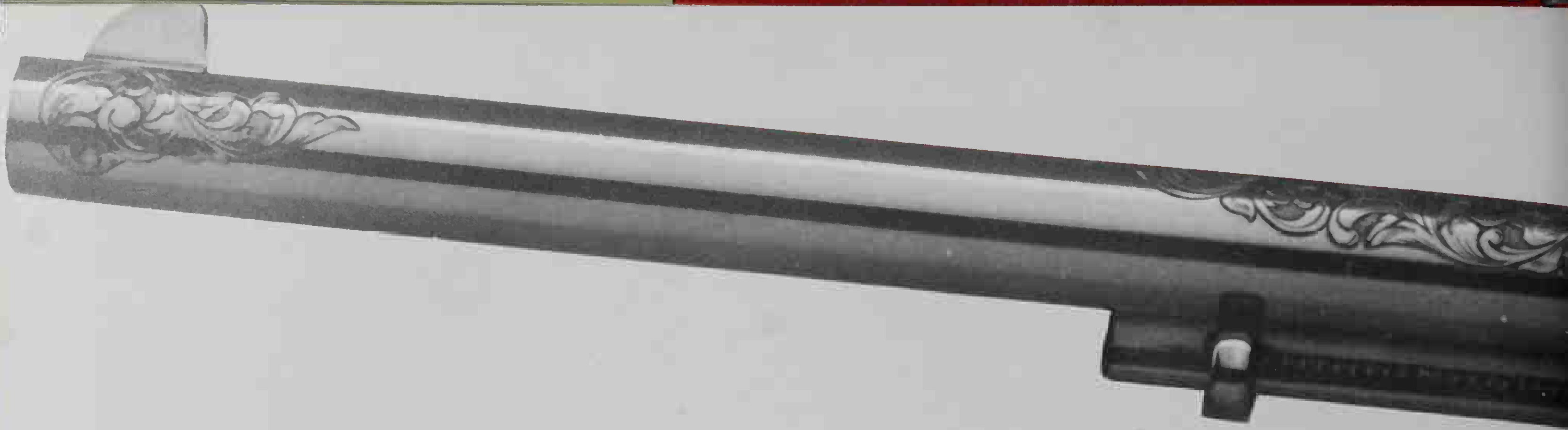
Office of the Historian, Colt Firearms Division, P.O. Box 1868, Hartford, CT 06101.

cases are manufactured to the highest quality standards to ensure compatibility with the firearms and the setting in which they will be displayed. A choice of blue, red or forest green lining colors are available.

A new line of glass wall/walnut frame presentation cases is available that allows an upright firearm to be viewed from four sides and top while protecting the firearm from the adverse effects of unsupervised handling. These cases are ideal for collector shows and are available on special order for most current models.

The Custom Gun Shop also presents fine, crafted custom grips: grips of ivory, and of rosewood, walnut and bacote woods can be fitted to all Colt models. Grips can be ordered with gold or nickel Rampant Colt medallions to complement the color of the finish selected on the firearm. Colt Single Action Army grips are now crafted with a blind screw hole on the left grip to enhance their appearance. Single Action Army wood grips can now be custom fitted to the traditional one piece configuration upon request. Checkered grips in the fleur-de-lis pattern can be ordered for the Single Action Army in any of the above choices of grip material. Special grip medallions may also be ordered on commissioned products.

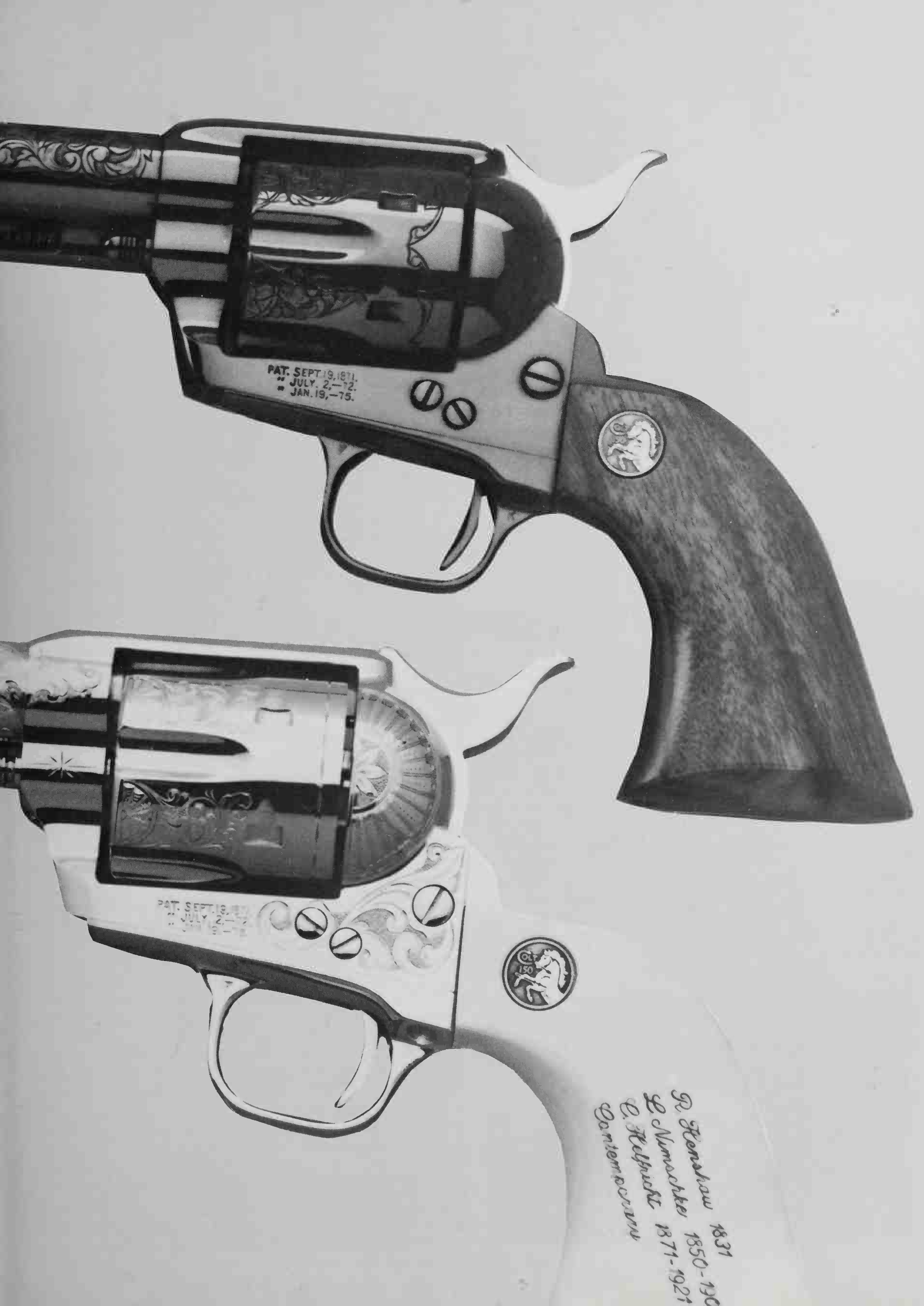
The Colt Historian authenticates production and shipping information essential to establishing the value of firearms. A Colt historical letter adds value to any collection piece by adding knowledge about past or current production. Letters serve to assure buyers and sellers that the basic physical characteristics of a gun are consistent with original factory records. Letters also provide valuable documentation for insurance policies that must rely on appraisals and certifications of authenticity. Thus the investor, the history buff and the collector all derive valuable benefits from this unique service.



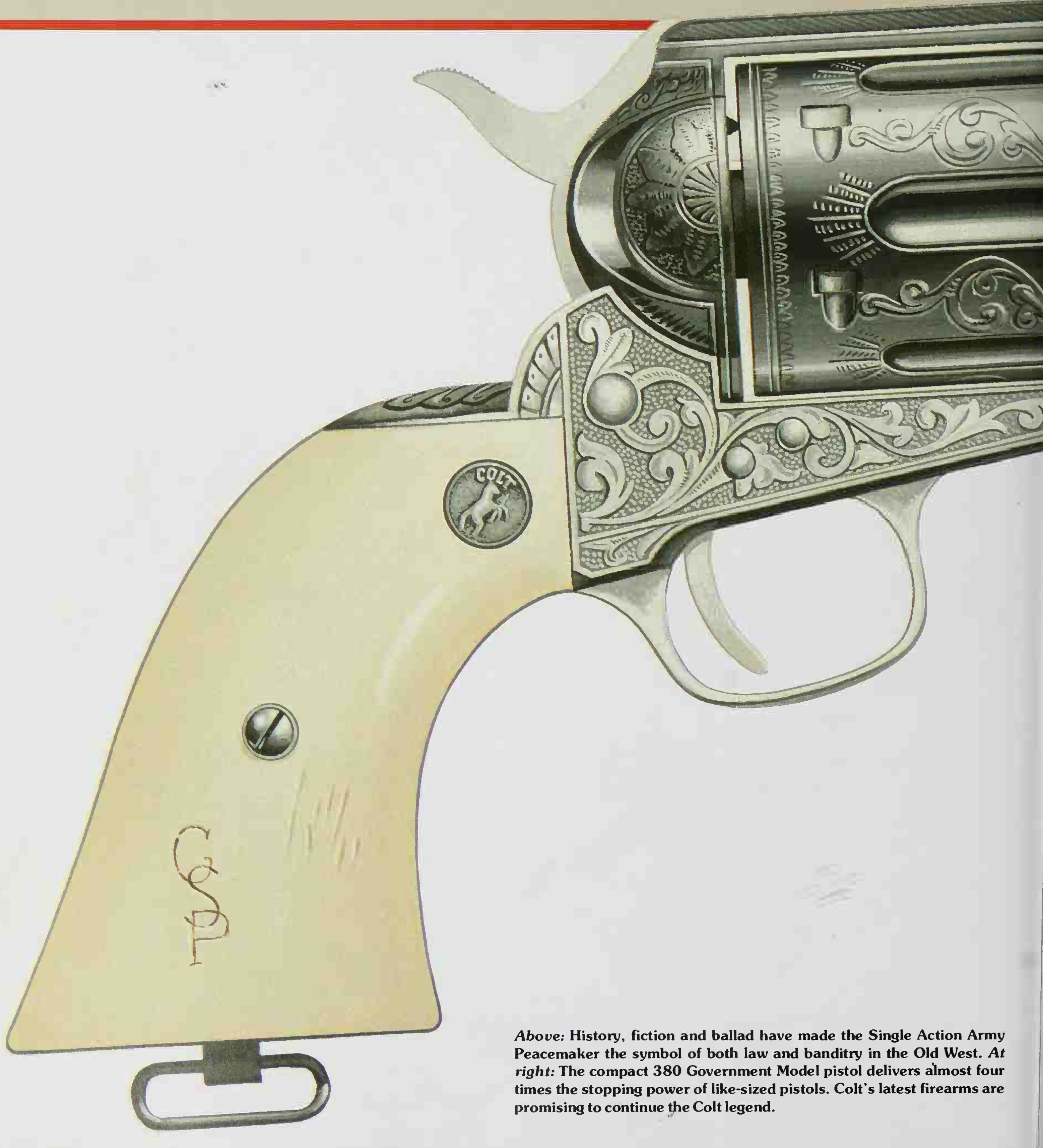
No. 232 Log Cabin Library
LOG CABIN LIBRARY
THE DALTON BOYS ON THE RIO GRANDE
The Mexican Raid
By W. B. LAWSON

COLT SINGLE ACTION

At left: What more could a Wild West enthusiast want? This hobbyist seems pleased with his collection of Log Cabin Library magazines and his beautifully engraved Colt. *Above top and bottom:* A fine-grade Colt 150th Anniversary Commemorative pistol and a Colt 150th Anniversary Engraving Sampler in four styles of engraving.


PAT. SEPT 19, 1871.
" JULY. 2,—72.
" JAN. 19,—75.
PAT. SEPT 19, 1871.
" JULY. 2,—72.
" JAN. 19,—75.
150
R. Henshaw 1831
L. Nimschke 1850-190
C. Helfricht 1871-1921
Contemporary

The Tradition



Above: History, fiction and ballad have made the Single Action Army Peacemaker the symbol of both law and banditry in the Old West. *At right:* The compact 380 Government Model pistol delivers almost four times the stopping power of like-sized pistols. Colt's latest firearms are promising to continue the Colt legend.

Continues

Today the tradition of excellence continues on at Colt. Bill Stokes, Vice President of Manufacturing says, 'The bottom line is to build the quality into Colt products at the very beginning rather than repairing them over a period of time.'

Colt employs extensive quality improvement programs in all phases of production and finishing. These programs require supervisors to inspect the production outputs of their respective departments at least twice per day. These inspections are made using gauges, micrometers and other testing apparatus. When a new run of parts is begun, this inspection process is actually a careful observation of *all* parts on that run as opposed to a random sampling.

Those particular parts of a firearm that could affect function and safety are denominated 'critical operations' and extra attention is paid to their fabrication and milling.

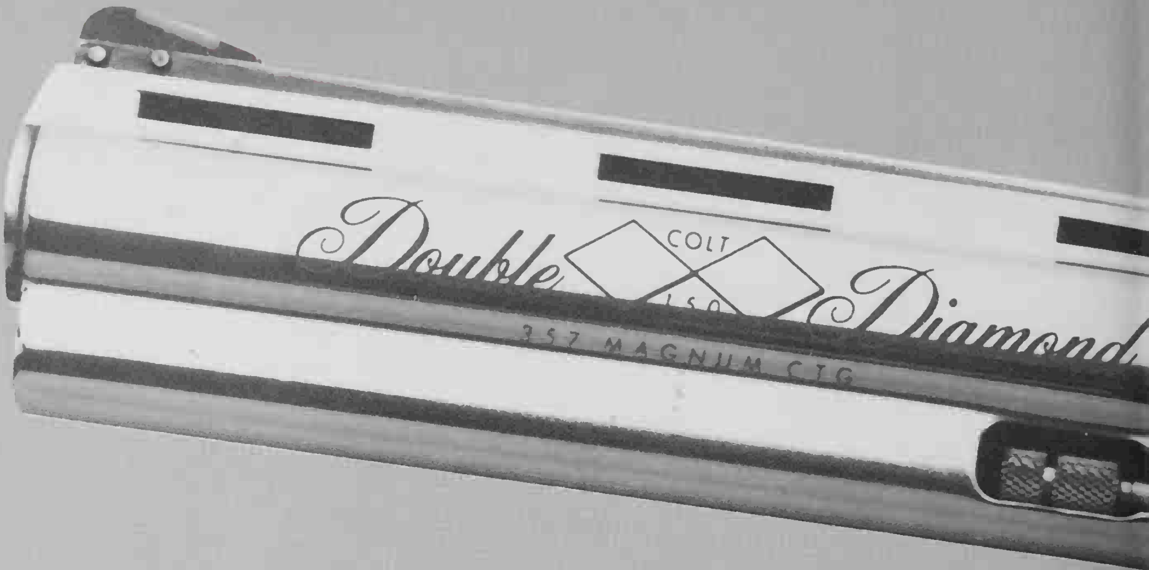
Every setup person and supervisor is required by Colt to attend a 22 week training program at Hartford State Technical Institute. The 88 hours of classroom work is taken up with such subjects as reading a blue print, setting up a particular machine properly, and the basic shop math needed to carry out assigned responsibilities.

Colt personnel are also trained in the use of computer aided design and manufacturing processes. Colt is in the midst of a modernization program which will bring these technologies to bear upon its products.

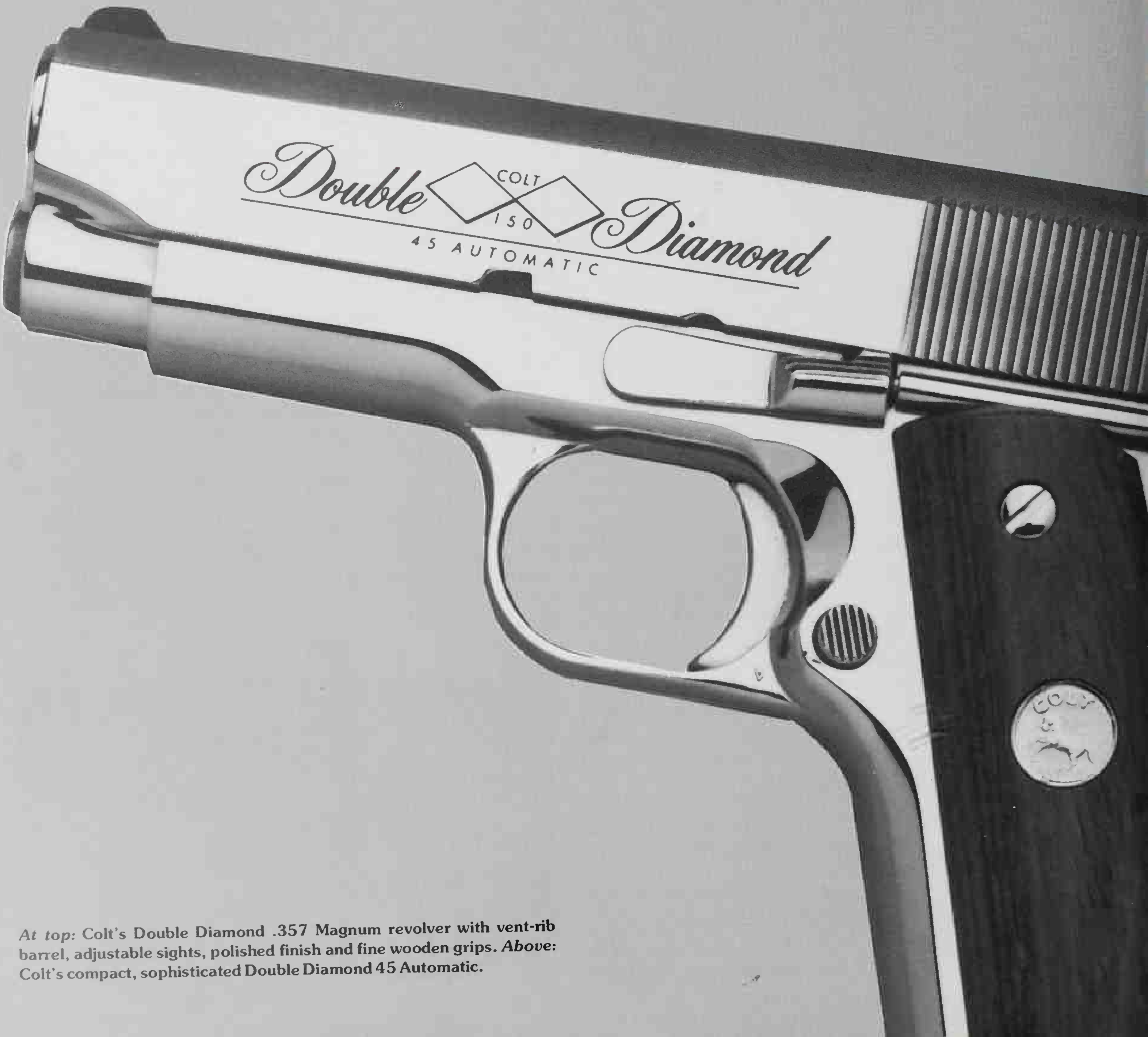
Since the raw materials used in the fabrication of the firearm are just as important as the finished product, Colt's quality control extends 'backwards' to their supplier's operations, as well. Each year, Colt Firearms gives its 'Vendor of the Year Award' to its best supplier on the basis of quality and dependability of delivery.

But quality control does not begin with the raw material and end with the finished product for Colt. Colt Firearms maintains a customer service center as well as 120 local service centers worldwide. Even this service center network is currently being computerized in order to ensure ongoing customer satisfaction.

The history of Colt firearms began with cap and ball pistols and moved through the conversion processes involved in adapting to the new center-fire cartridges. Single action, and then double action revolvers were, and still are, produced. The turn of the century brought the advent of automatic weapons to the Colt line of products. Today, Colt firearms defend the nation as a whole, and its citizenry in particular. The spirit of Samuel Colt lives on.



Double COLT 150 Diamond
357 MAGNUM CTG

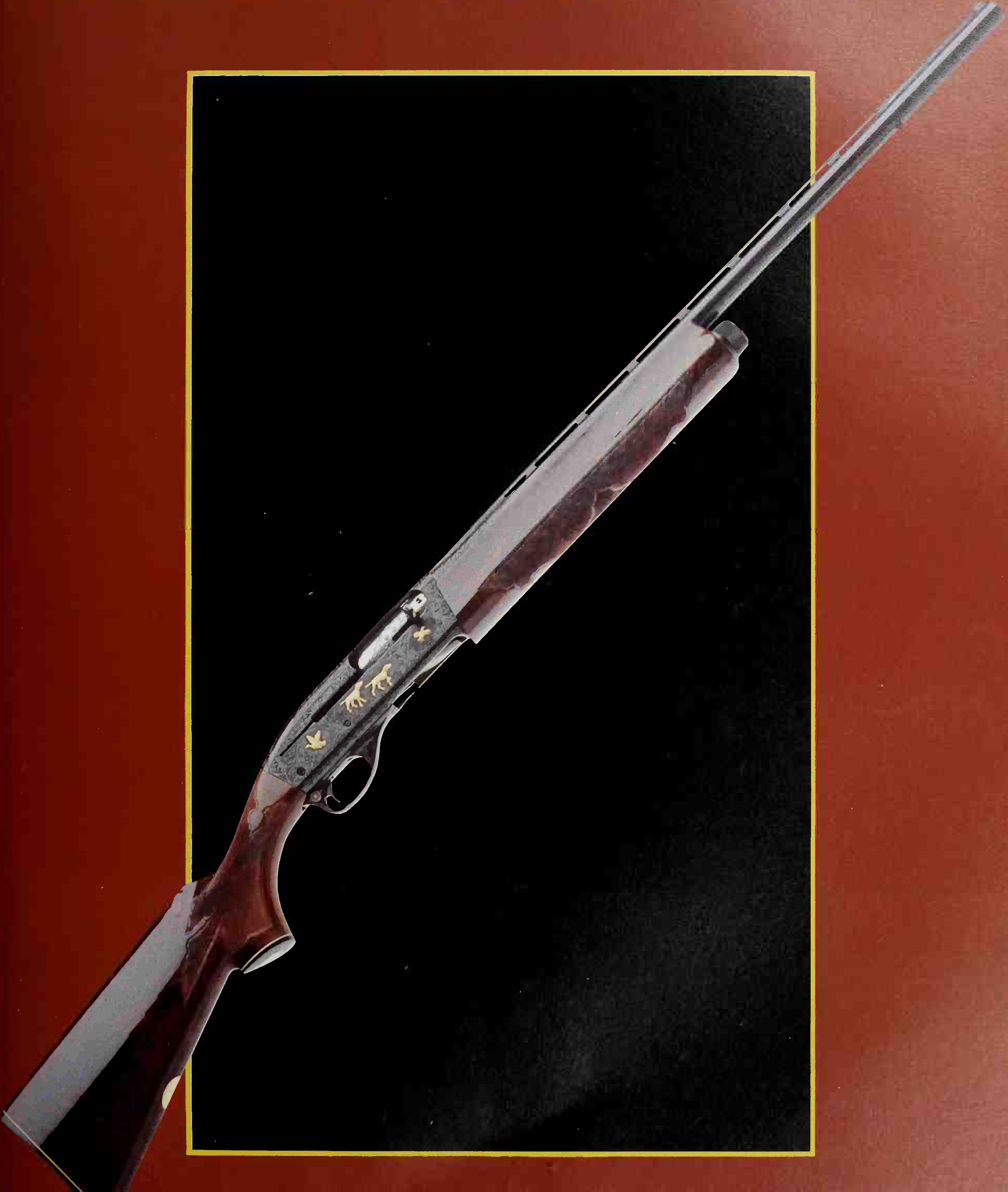


Double COLT 150 Diamond
45 AUTOMATIC
COLT

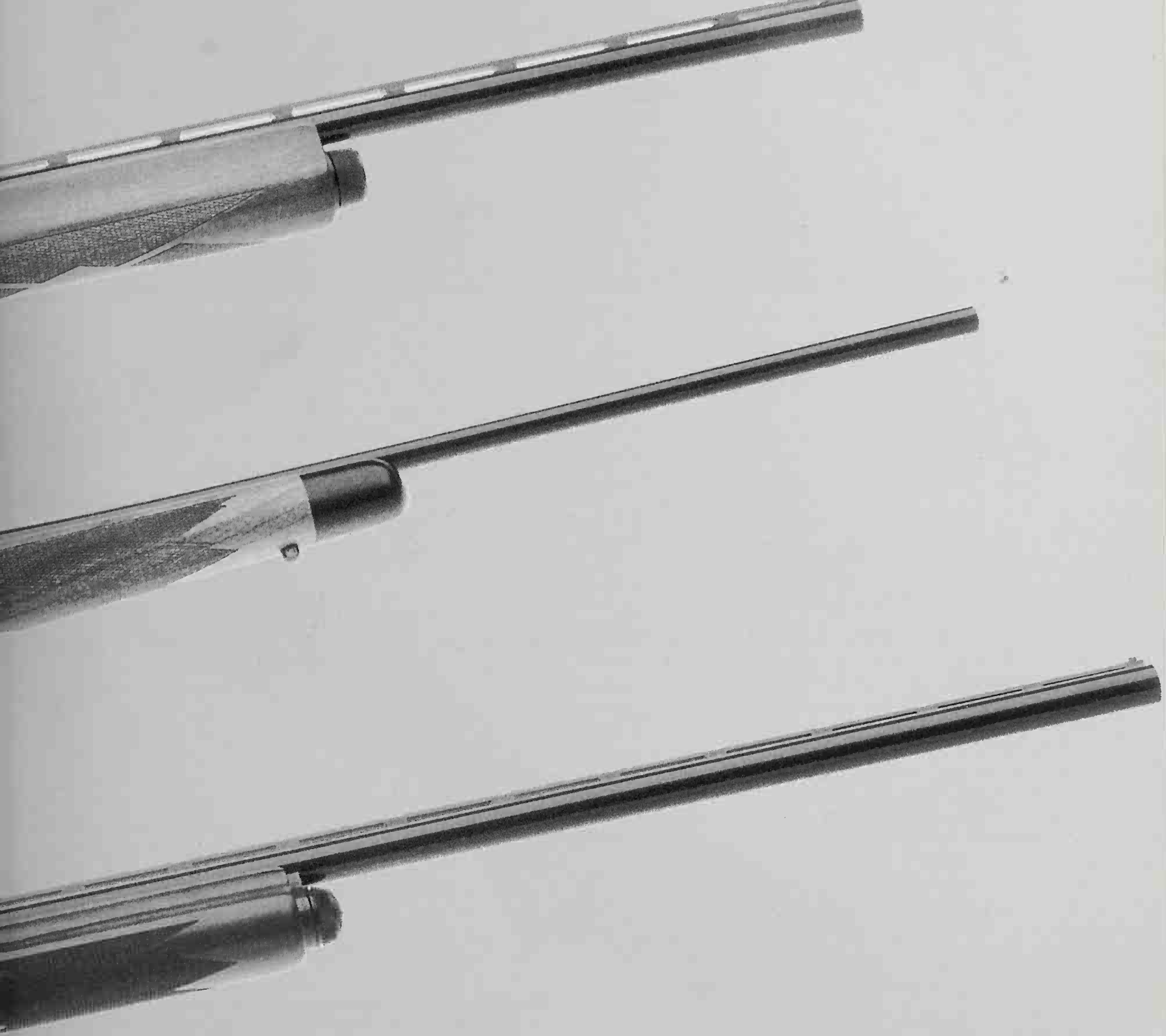
At top: Colt's Double Diamond .357 Magnum revolver with vent-rib barrel, adjustable sights, polished finish and fine wooden grips. *Above:* Colt's compact, sophisticated Double Diamond 45 Automatic.

America's Premier Gunmakers

REMINGTON



Previous pages: A Model 1100 automatic shotgun with commemorative engraving from Remington's Custom Shop in celebration of the two millionth Model 1100 manufactured. *These pages, top to bottom:* The Model 1100 Special Field automatic shotgun, with four-shot capacity; the legendary Model 700 Mountain Rifle, a favorite in calibers up to .300 Winchester Magnum; and a Model 870 Wingmaster pump shotgun.



A Remington

The Remington Parker shotgun shown *above* is one of the many reasons that Remington tops many gun collector's lists. This excellent side-by-side features good balance, light weight and great 'pointability.' Shown *below, from left to right* are some of this gem's finer points—Remington's fine engraving on the receiver; precision-made breech components; and evidence that Remington workmanship continues right down to and including the butt-stock. Note the designs which adorn even the screws and screwholes here!

History

A history of the Remington Arms Company is a miniature panorama of American history itself. In 1816, on the heels of the War of 1812, Eliphalet Remington and his son, Eliphalet Jr, founded the Remington Company just outside of Ilion Gorge, New York.

Demand grew for the workmanship of the Remington father/son duo. Complete rifles were produced on a customized, individual basis, but profits were also to be had in producing barrels for other gunsmiths to be used in their own firearms. Increased demand always follows excellent workmanship, and the Remington business soon outgrew the production capacity of their original forge. In 1828, they moved their operation into Ilion proper, along the banks of the Erie Canal. The Canal at this time was the most important thoroughfare of commercial traffic in this region, and the new location proved to be successful indeed. The same year as the move to Ilion also brought tragedy. Eliphalet, Sr met an accidental death at this time.

The business expanded rapidly, and a year after the move, a second forge was installed to produce barrels, balls, and accessories. Because the Remingtons were selling principally to other gunsmiths, it is not uncommon to find REMINGTON markings on various *parts* of guns produced in this area during this period.

Eliphalet, Jr was now president of the company. He was a gunmaker and manufacturer first and foremost. While he was able to introduce many improvements in the fabrication of firearms and their accompanying parts, he is not remembered as a major innovator of the same genre as Samuel Colt, for example. Remington was a genius at combining the innovations and patents of others. Remington Arms was also a *production* facility, not particularly given to experimentation with untried ideas. So while blazing inventiveness was not a hallmark of Remington Arms, neither was the company dependent on just one invention or set of innovations for its continuing existence. In fact, Remington has one of the longest continuous histories of any US arms manufacturer.

Eventually, Eliphalet Jr's son Philo came into the family business, and the company changed its name to E Remington and Son. John Griffiths of Cincinnati had originally contracted with the US Government to produce 5000 Model 1841 Percussion 'Mississippi' Rifles. He was unable to fulfill his contract and the Remingtons took it over. This afforded them their first opportunity to produce, on a large scale, weapons for the government. Following this first contract, the government awarded the Remingtons a second contract for 7500 more of the same model. Remington had broken into the arms trade in a big way! In 1846–7, Remington also received a US Navy contract for the production of the Jenks Breech-loading Percussion Carbine. In 1851, another contract followed for the production of 7500 Model 1841 Percussion Rifles. By this time, demand was so great for their products that the Remingtons had expanded their manufacturing facilities to nearby Herkimer, New York. In the early 1850s, two more of Eliphalet, Jr's sons—namely, Samuel and Eliphalet III—entered the family business and E Remington and son was changed to E Remington and *Sons* to account for what was now a larger family partnership.

The Remingtons were not willing to confine themselves to the production of rifles and other long arms alone. Samuel Colt had patented his revolving percussion revolver in 1836, and a little over 20 years later—in 1857—the Remingtons introduced their Beals Pocket Revolvers. During the Civil War, Remington—along with all other arms manufacturers in the United States—devoted its complete time and resources to the fabrication of all sorts of firearms for the war effort.

Eliphalet Jr died in 1861, and his son Philo succeeded him as president of the firm. At the end of the Civil War, the company was reorganized as a corporation that retained the name of E Remington and Sons.

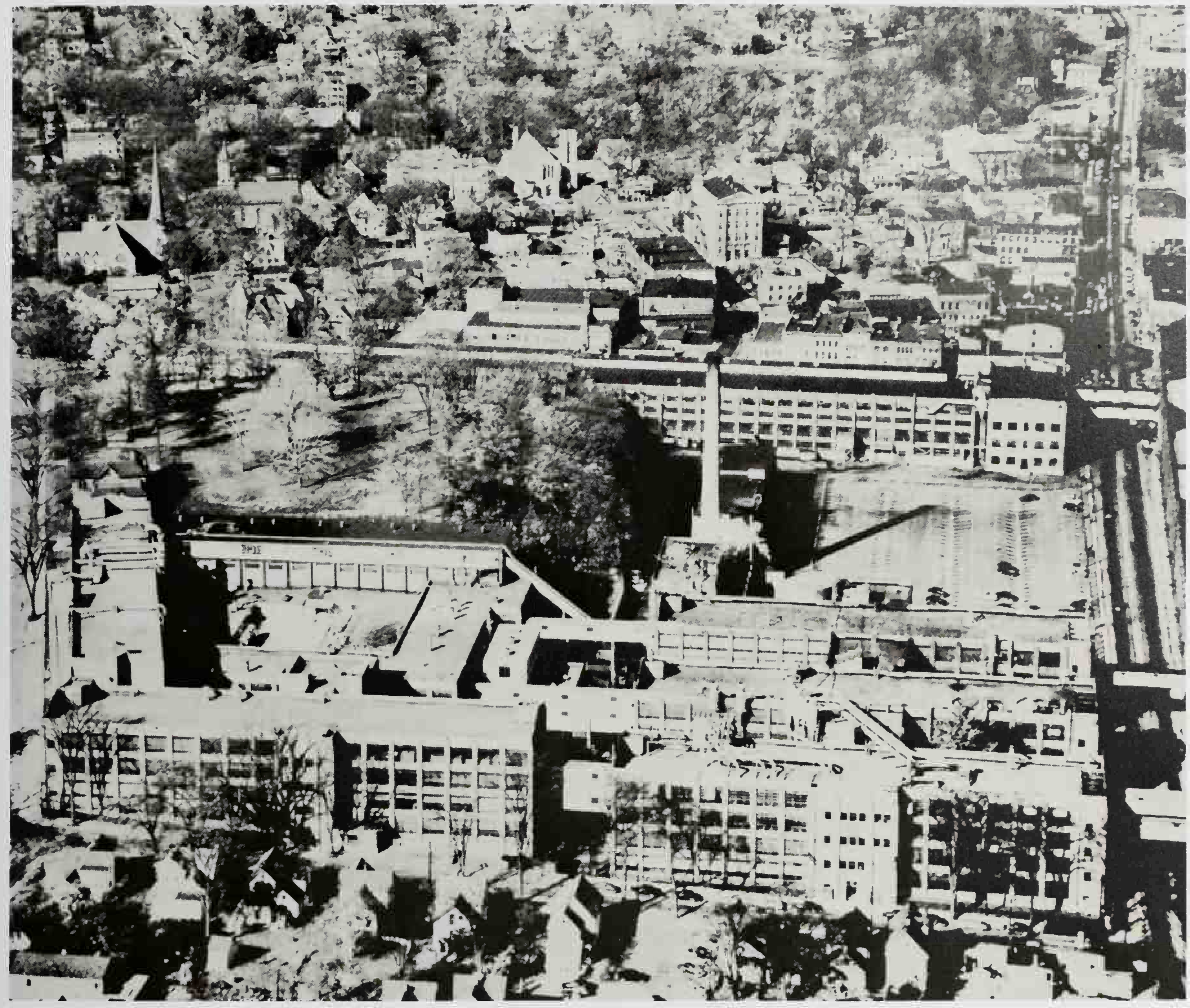
The Remington company played a significant role in the great American westward expansion. The company introduced a great variety of pistols and rifles. The most famous of their many lines of products was the 'Rolling Block' series of rifles. These were eagerly purchased by gun merchants both in the United States and abroad. Remington soon found itself squarely in the midst of a very lucrative stream of European contracts to upgrade the various armories of these nations. Samuel Remington died in 1882, and his brother Philo assumed full management of the company. In 1886, the company was in dire financial straits and went into receivership.

The company was acquired by Hartley and Graham in 1888. H and G was a famed New York military and sporting goods firm which had, twenty years earlier, founded the Union Metallic Cartridge Company of Bridgeport, Connecticut.

E Remington and Sons was renamed the Remington Arms Company and functioned as such from 1888 until 1912, when it was merged with the Union Metallic Cartridge Company. From then until 1934, the company was named Remington-UMC. The Great Depression brought yet another reorganization of the company and its name reverted to 'Remington Arms Company, Inc,' by which it is still known today. The DuPont Corporation acquired controlling interest in the firm in 1933.

Unlike other major American gun manufacturers, the definitive history-to-date of Remington Arms has yet to be fully written. There is really no fully documented chronological history of the company. Firearms collectors continue to have a very difficult time in cataloguing and tracing the numerous models and variations of Remington firearms. Often, manufacturing specifications would shift within the same model of gun without being documented by the factory, thus leaving collectors and dealers to surmise for themselves the details and peculiarities of whole lines of Remington products. The Remington Factory at times apparently overproduced, in anticipation of entering into contracts which never materialized. These inventories of parts were then salvaged by being used in other models for which

Below: This Remington Sportsman 581 is just one of the fine rifles made by Remington, America's oldest sporting rifle manufacturer. The 581's five-shot capacity and rugged construction make it the ideal 'plinker.' _At right:_ The Remington Arms plant at Ilion, in the 1940s.



contracts did exist. Thus 'variations' within model runs are numerous and plaguing. Definitive technical data simply does not exist for many Remington models.

Tracing Remington's history as well as documenting model productions is for the most part a trip through uncharted waters. Gun collectors and historians are often at variance one with another as to production details concerning a particular model or variation on a model. These 'grey areas' of Remington history and production are both numerous and intriguing. They provide the historian and researcher with fertile, and sometimes frustrating, fields of endeavor. However, collectors have a difficult time establishing the rarity of certain models; this lends itself to confusions about value and the pricing of certain specimens.

It is interesting to note, also, that engraved Remingtons are somewhat rare. The only real engraving that was done at the factory was apparently on the Magazine Derringer Model. When engraving was done, it was usually very simple in form and basic in design. Most engraving is found on the early percussion handguns, but does not in any way compare to the engraving on contemporaneous Colts. When, however, engraving was performed by Remington, it was accomplished by an acid etching process, in contrast to the rolled design made famous by Colt. Some engraved Remington longarms were produced but they are generally considered to be quite rare.

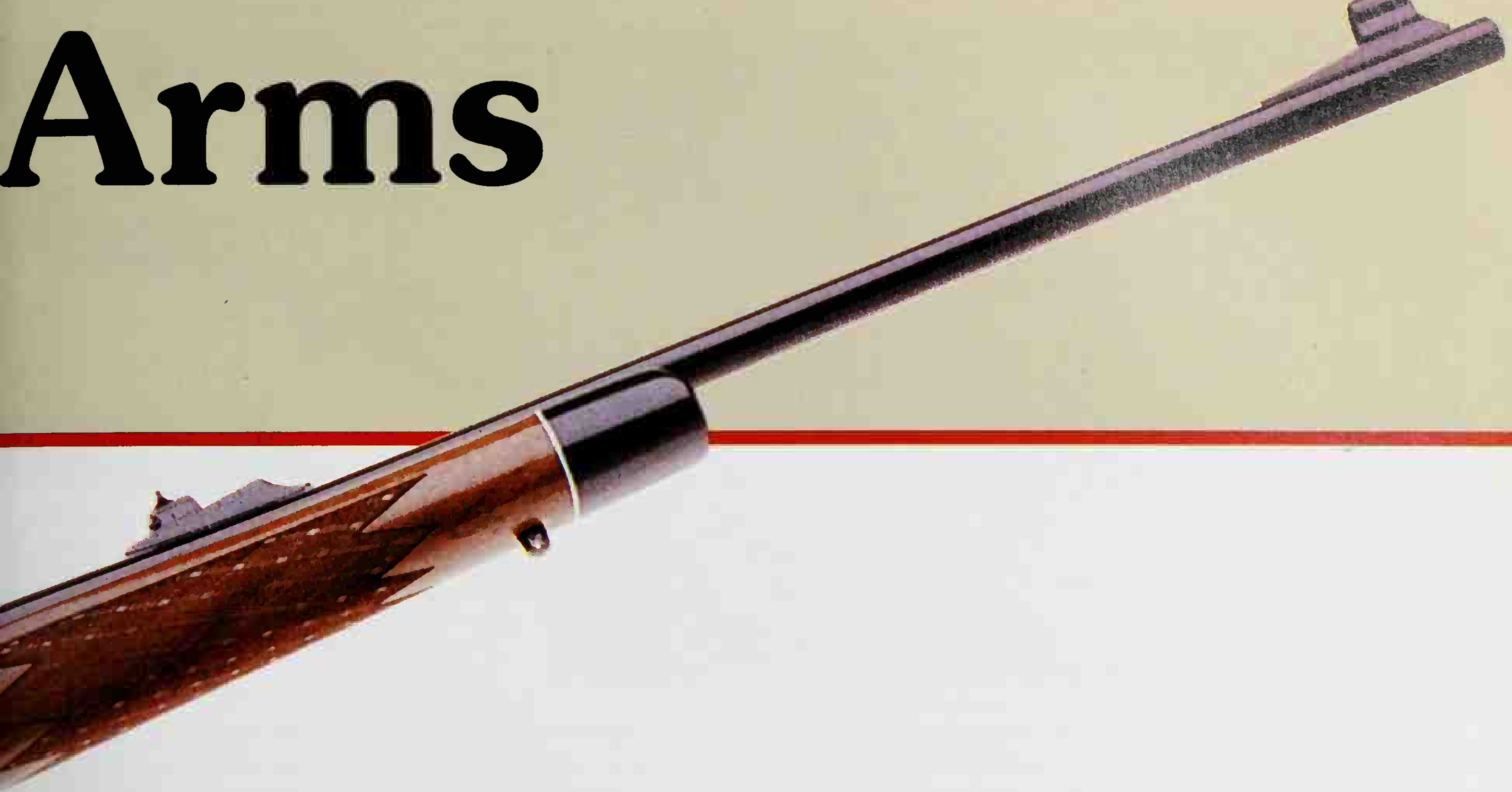
Boxed sets of Remington pistols are also considered rarities, because Remington Arms did not go in for exquisite presentation-grade specimens, as did some other American manufacturers. Remington did, however, employ 'specialty' grip materials in its production. Ivory and pearl were the most often used materials in Remington decorative grips. The value of a gun thus equipped is considered to generally be a function of its type—in conjunction with the *kind* of *grip material* employed and the overall *condition* of the firearm.

Today, Remington produces numerous lines of both sporting and military weapons. Remington Arms are found at all 'wavelengths' of the firearms spectrum. Remington does offer superb finish and fine wood (and other) stocks. The longest-lasting American gun manufacturer continues to uphold its tradition of offering the public well-made, accurate and superbly finished weapons for a fair price.

Civilian

Above: The Remington Model 700 hunting rifle. At right: Montanans Thayne Bowman (white shirt) and Tom Yule (plaid jacket) and their Remington Mohawk .222s, equipped with Leopold scopes, and Tom's son Tim with his Bushnell Sportview 4x-equipped Mohawk.

Arms



Non-military use of firearms generally falls into the categories of hunting and target shooting. Conservation has come to characterize the first group and national and international competitions have come to characterize the second category.

The Remington Arms Company has played a significant role in both of these areas of civilian firearms use. One of the hallmarks of Remington guns is that they are priced for availability. Probably a greater percentage of firearms in private hands in the Unites States are of Remington make than of any other manufacturer. Remingtons are functional, reliable and tend to maintain their value.

Rifles

Firearms literature abounds with never-ending debates about what constitutes the 'perfect' rifle. This debate tends to center around a balance between two points. The first is the caliber desired (which itself tends toward a 'perfection' of its own) and the second is the rifle itself. Choosing a firearm for personal use requires that the purchaser has in mind beforehand the use to which the gun will be put. This involves such considerations as whether one wants exclusively to shoot targets, or shoot *and* go hunting for game, or wants to hunt exclusively; also, if shooting targets, at what ranges and distances will one be shooting, and will it be serious competition shooting; and if hunting, what sort of game and what sort of habitat does this game prefer—and so on. Does one require long range accuracy or does what one would be doing call for sheer muzzle power? The type of action of the gun must also be taken into account; also, the 'convenience' of a rifle—that is, its weight and handling capabilities—are of prime importance in the selection process. The more forethought that is put into choosing a rifle, the greater will be the satisfactions of using that gun in the future.

Probably, the most popular rifle caliber is the .30-06, a caliber that has bagged more brown bears and grizzlies than any other caliber of this century. It is available in a wide variety of bullet styles and weights. Almost all rifle mechanism types are available in .30-06 caliber with the exception of a few lever-actions. While it is true that, technically speaking, no caliber of rifle is 'perfect,' the .30-06 comes about as close as one can come to perfection in an imperfect world.

After World War II, one of the more interesting innovations that occurred in the American gunmaking industry was the introduction of Monte Carlo stocks. The Monte Carlo comb, when incorporated into a stock design, raises the mid part of the stock sufficiently to cause one's cheek to rest at a higher position when looking down the sights. Remington began producing Monte Carlo stocks for many of its models. Firearms writers and critics both raved about and reviled the Monte Carlo design. Some claimed that it reduced perceived recoil when the rifle was fired. Others claimed (and rightfully so) that the Monte Carlo comb actually *increases* perceived recoil. Actually, the Monte Carlo design was simply a way of skirting the inherent design problems of pre-World War II stocks without actually doing anything about them. When soldiers began returning from World War II, their demands on their hunting rifles were greater than before the war. Battlefield experience yielded more sophisticated thinking about what they actually wanted out of their rifles.

Most everyone in this period wanted telescopic sights; but telescopic sights and the old stock designs were not an easy match. The Monte Carlo design at first seemed to come to the rescue, offering a higher cheek position—and thus better eye access to 'scopes'—than the old stocks did. So the band wagon was set into motion, and Remington, along with most other manufacturers, began making Monte Carlo stocks available on their most prominent models.

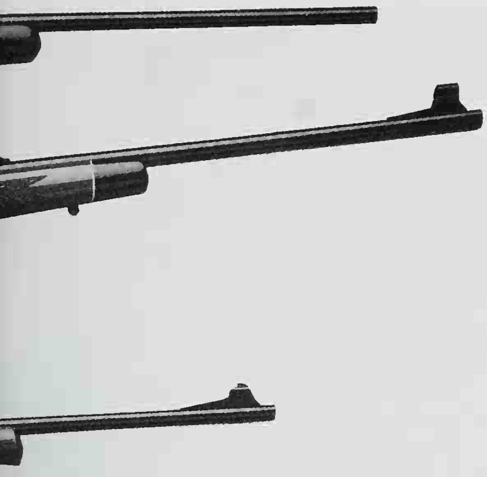
By the middle-to-late 1970s the Monte Carlo fad had pretty much run its course. In the early 1970s, even before this turn of events, Remington contacted Jim Carmichael—who is generally acknowledged as the dean of modern gun writers—with a request that he design a classic-styled stock for the Model 700 bolt action rifle. Carmichel says that designing the stock was something of an exercise in frustration, but the Model 700 Classic was a result of his labors. The Model 700 Classic certainly looks better than Remington's old Monte Carlo stocks and actually feels better to shoot. This Remington innovation—that of designing a 'classic' stock—forced other gunmakers to follow suit. The 'classic design' has by now superseded the Monte Carlo in most respects. It actually solves the pre-World War II stock design problems by supplying the higher comb needed for telescopic sight shooting *and* eliminates many of the undesirable features of the Monte Carlo design. 'Classic' stocks feature a straight, high comb and reduce perceived recoil. In addition, they generally look a great deal better than Monte Carlos.

Remington had been active in production of weapons for World War I, but with peace in 1918 and the Great Depression of the 1930s, demand virtually dried up for Remington products. The factory at Ilion continued to exist, but shipments of products were few and this period produced considerable losses for the company. During this time, Remington's profitably was mainly due to its cartridge division in Bridgeport. Despite the overall depressed economic circumstances, the DuPont Corporation saw an opportunity in Remington, and purchased controlling interest of the firm in 1933. At this time, Remington was running third in the American arms market behind Winchester and Savage. DuPont's original intention was to close the firearms division of the business and concentrate wholly on the cartridge division. But before doing so, company policy dictated that a survey be taken of the firearms division before closure. George Read was sent from DuPont of Wilmington to Ilion for this purpose. Read would later recommend that the firearms division not be dissolved but rather upgraded and modernized. DuPont followed through by pumping investment dollars into Ilion. New equipment was acquired, fabrication processes were set up, and attempts were made to modernize the whole manufacturing process.

During this time, the most popular bolt action rifle on the market was the Winchester Model 70. Remington undertook to compete with the Model 70 by introducing the Remington Model 720 in 1941. The Model 720 was indeed competitive with Winchester but in 1941 the United States was forced into a war not of its own making. The production of sporting arms was simply set aside for the now immediate problem of emergency war production. It is interesting to note, however, that while Remington

was blessed with huge arms contracts from the government for World War II, these contracts resulted in very meager profits for the company. This is an example of a little known historic fact: Arms manufacturers do not generally profit from war.

During World War I, Congress had determined that no manufacturer or transportation agency would engage in war profiteering. When World War II fell upon the nation, Congress was once again determined that windfall profits were to be kept at a minimum. But Remington's factories and facilities had to be expanded and tooled up for the increased war production. This overbuilding and excessive expansion could prove disastrous for Remington after the war was over. DuPont management realized this and undertook an extensive 'Reconversion and Modernization' program to utilize the expanded facilities of the company after the



At right: **The Remington Model 541T bolt action rimfire rifle. Model 700 rifles feature hunting calibers and a variety of types.** ***Above, from the top down:*** **The Model 700 Mountain Rifle, the Model 700 BDL with Monte Carlo stock and the Model 7 lightweight 700 variant.** ***Below:*** **A close look at a Remington Model 700 Mountain Rifle.**

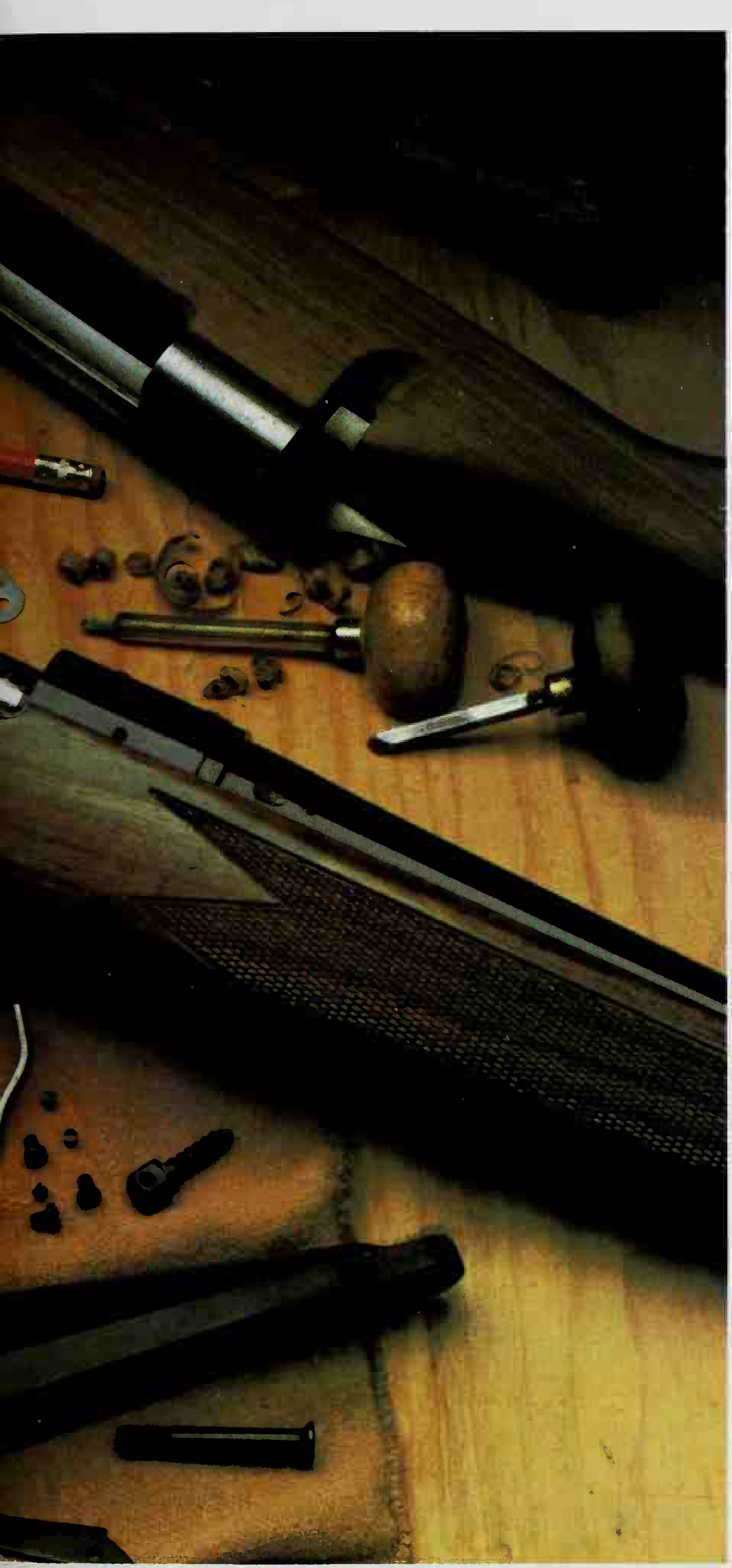
war, and thus insure its continued existence. At the heart of this project was the design and fabrication of the Model 721 and 722 rifles. These rifles had to succeed or Remington Firearms itself would cease to exist.

When crucial times arrived, crucial personalities arose. Mike Walker became the driving force behind the production of the new rifles. Walker hailed from Iowa and had answered an ad in the American Rifle magazine in 1942 when Remington was searching for research engineers. Remington was gathering its engineering talent at this time in order to meet the intensive wartime production schedule. This pool of talent would later prove indispensable to the success of the company. Technically, the Model 721/722 rifle project began on 12 August 1942, when $200 was authorized to prepare a project outline. In 1943, the research and development department spent $11,500 for background research—but it was not until almost at war's end that the project was again a priority.

In August of 1944, Walker was placed at the head of the 721/722 project and given $35,000 to begin building prototypes for the new rifles. Walker headed a team of designers which was remarkably small for what was to become such a major weapon project: only three men—Dana McNally, Leon Rix and Knute Reed—were assigned to produce the drawings and fabricate the prototype form.

The feasibility studies that had been done in 1942 established the rough parameters of what the 721/722 rifles should be. These parameters stated that the rifles should be light in weight and fast handling; their production costs must be low enough to provide sufficient profitably for the company; they would have to be capable of being manufactured with mass-production techniques; and the new rifles were not to compete head to head with the Winchester Model 70, but rather were to eat into the Winchester Model 94, Marlin Model 86 and Savage Model 40 markets. The fascinating thing about the model 721/722 project is that it brought to bear a sectional talent in such a way that the rifles that were produced are, even today, bench marks in the production history of center fire weapons. In terms of productivity, the Model 721 rifle only required 60 machine operations, whereas its predecessor, the Model 720, required 250 such operations. Here was efficiency indeed! Because of the unique production processes involved, precision parts could be produced without the high degree of individual workmanship previously needed.

The original 721/722 design drawings called for the rifles to be produced in four barrel lengths ranging from 20 to 26 inches. However, production models were actually produced in 24 and 26 inch lengths. Later 22-inch barrels were offered for some calibers. The 721/722 weighed only 7.25 pounds at the most. By comparison, Winchester's Model 70 weighed 7.75 pounds and most of Remington's other competitors



weighed in at a hefty eight pounds or more. Standard stocks for the 721/722 were cut from American walnut and featured a standard pistol grip with a semi-beavertail forearm; and the two basic stock designs were the iron sight version—which dropped 1.87 inches at the comb and 2.87 inches at the heel—and a high comb stock which dropped 1.38 inches at the comb and 2.19 inches at the heel.

The 721/722s were marketed in five chamberings: .30-06, .270 Winchester, .300 H and H Magnum, .257 Roberts and .300 Savage. The 220 Swift was originally planned for the 721 rifle but was dropped in favor of the Remington .222 cartridge. The .222 Remington is still of universal popularity today as a fine varmint caliber. The introduction of the .222 Remington greatly enhanced the sales of the short-action 722 rifles. In time, other calibers became available for the Model 721, namely the .280 Remington, the .264 Winchester Magnum, the .308 Winchester, the .244 Remington, the .222 Remington Magnum and the .243 Winchester.

The series of tests to which the 721/722 rifles were subjected were extensive almost beyond belief. Various cold, rain, dust and endurance tests were devised. Ice tests and blow-up tests were later added. Machinery was set up to subject the rifles to 50,000-round firings in order to check the wear on the bolt and firing systems. Even gas leak tests were conducted in an 'iron lung' type of device. These last tests were meant to determine safety parameters beyond those generally encountered by hunters. The blow-up tests were by far the most publicized. These tests were conducted in the .30-06 caliber, which was considered to be potentially the most dangerous load fired through the 721/722 rifles. No fewer than five 220-grain cartridges were lodged into the rifles one after the other, and then the weapon was fired. Remington estimated that the internal pressures thus created exceeded 300,000 pounds per square inch. This was testing taken to extraordinary lengths, but it did provide the company with excellent advertising and valuable data concerning the strength of the new actions.

Remington had a fine product, but still had to convince the United States patent office that no one else's patents were being stepped on by this new product. The company's lawyers had to produce written depositions that established when, where and who

***At left:* The Model 700 is world renowned for its accuracy and strength. Available in 16 calibers, this big game rifle features handcrafted fit and finish—as is implied by this photograph. *Below:* The potent Remington 660 Carbine with sling and shock pad, and *below left*, without same.**

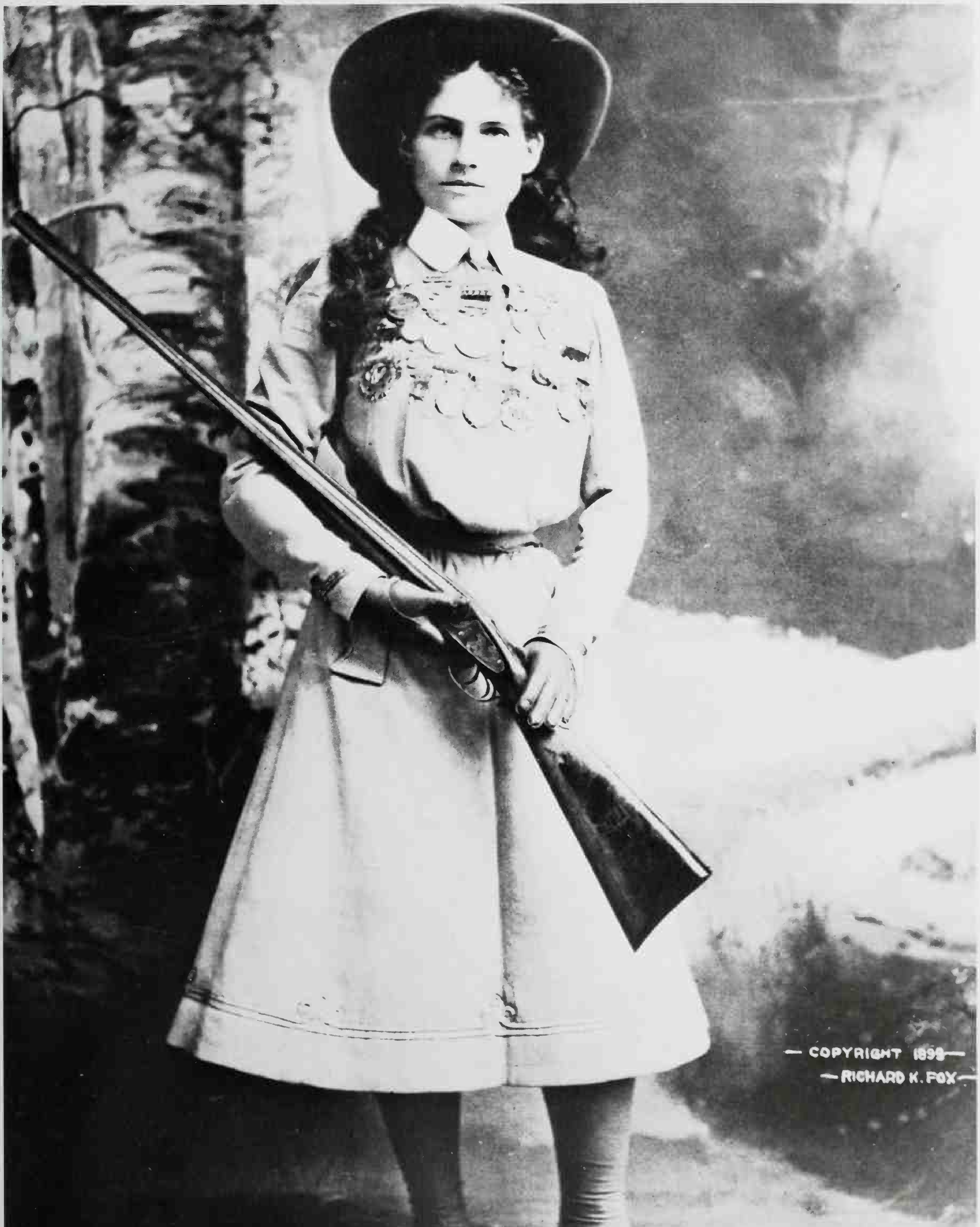
actually worked on the new rifles. The patent people in Washington wanted to examine all of the blow-up test specimens as well as Remington's competitor's specimens.

The 721/722 project was kept a virtual secret at the factory. In the spring of 1947, rumors were surfacing of a new Remington product. At this time, some writers were actually shown the first prototype specimens. They immediately recognized that here were entirely new rifle designs, not just remakes composed of spare military parts. The official announcements were made and actual marketing began in January 1948.

The 721s and 722s were first marketed at more expensive prices than had been originally planned. The 721 retailed for around $80.00 and the 722 for around $75.00. By this time, the Winchester 94 sold for about $60.00 and the Marlin Model 86 went for about $59.00. The purchaser of the Remingtons paid a little more, but got impressively much more. This fact actually made the $110.00 price tag on the Winchester Model 70 seem expensive in comparison to what the buyer was actually getting for his money. The 721/722s were in fact just as good as the Winchester Model 70s at considerably less cost. Many shooters during this period had actually become accustomed to paying upwards of $200.00 for custom rifles built from surplus military parts. Thus a truly fine $80.00 rifle with state-of-the-art performance was a welcome and eagerly sought-after piece of merchandise. Deliveries of various calibers began in 1948 with the .30-06 Springfield coming out in March of that year, followed by the .300 Savage in May, the .270 Winchester and .250 Roberts in July, and, finally, the .300 H and H Magnum in September. Two grades of the rifle were made—the standard and the fancy. The fancy grade was subdivided into various classes: the B Special with a checkered stock of selected walnut, and the D Peerless and F Premier grades which featured progressively finer wood and more detailed engravings.

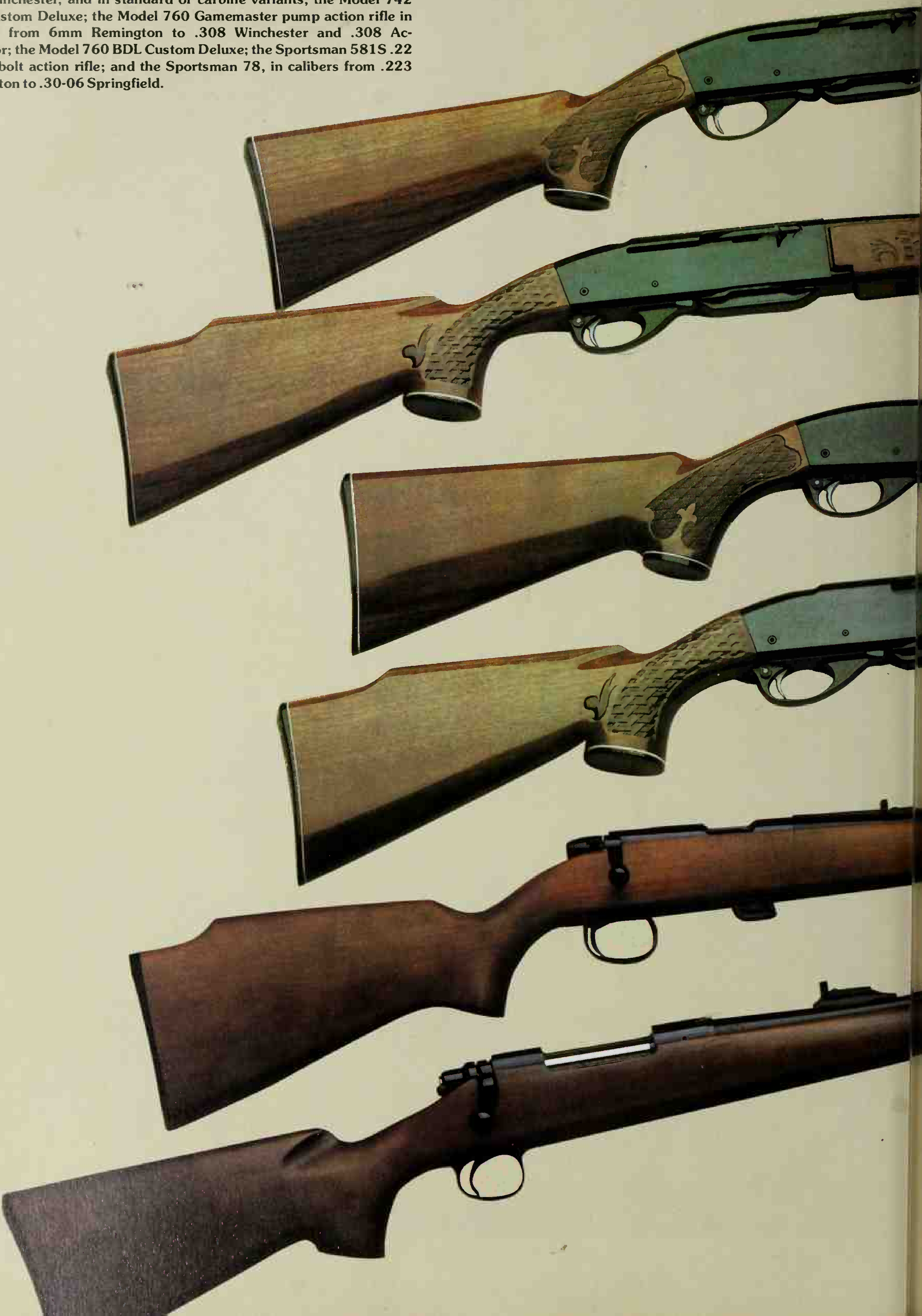
Obviously, DuPont management was in the firearms game to make money. It was estimated that the 721/722 rifles had to be sold at a 1500 per month clip in order to break even. When one considers the low production sales figures for pre-World War II rifles, a break-even point of 1500 specimens per month was indeed audacious—and the response of the market was overwhelming. People liked the rifles' light weight and good balance. Their speed and smoothness of operation was acclaimed. The clean stock lines and proportions, and the smooth-working, strong receiver were 'winners.' The safety was both noiseless and convenient, and the bolt handle and safety location were designed with low mounted scopes in mind. Even the trigger was adjustable—and best of all, the price was right.

***Below:* The Remington Model 788 is chambered for five calibers from .223 Remington to .308 Winchester, and has nine locking lugs. *At right:* The famous turn-of-the century sharpshooter Annie Oakley, the only woman to ever hold the 'World Champion Shotgun Shot' title, was married to trick shot Frank Butler, who became a Remington salesman. Annie's prowess was amazing, and she most often used Remington rifles and pistols. Here, however, she holds a shotgun which was custom-tailored for her in Great Britain.**



— COPYRIGHT 1899 —
— RICHARD K. FOX —

This page, from the top down: **The Remington Model 742 Woodsmaster autoloader, available in calibers from 6mm Remington to .308 Winchester, and in standard or carbine variants; the Model 742 BDL Custom Deluxe; the Model 760 Gamemaster pump action rifle in calibers from 6mm Remington to .308 Winchester and .308 Accelerator; the Model 760 BDL Custom Deluxe; the Sportsman 581S .22 caliber bolt action rifle; and the Sportsman 78, in calibers from .223 Remington to .30-06 Springfield.**

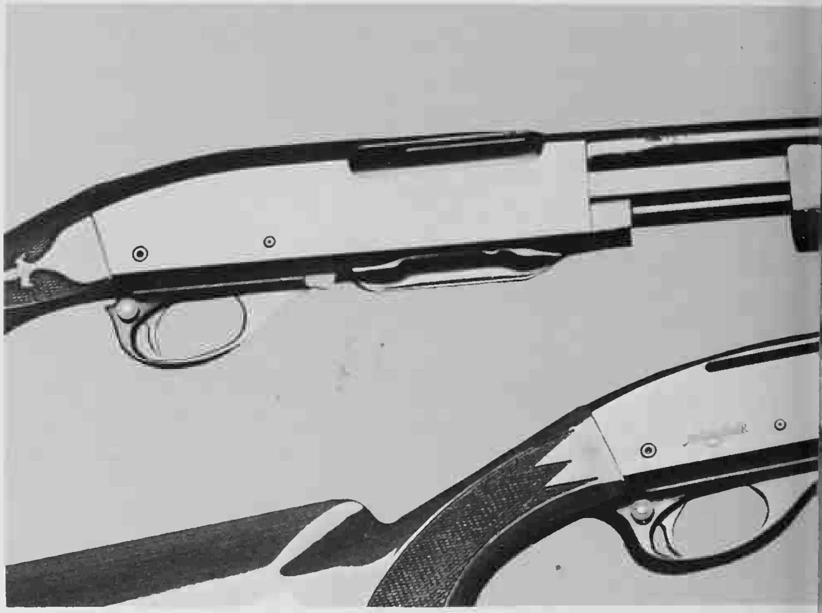


The first year's production (1949) was approximately 46,000 rifles; sales in 1950 exceeded 50,000. Remington was selling everything it could ship. There was an early demand for checkering on the standard model stocks, but this would have boosted the rifle's base retail price by $10.00 to $15.00 and Remington opted not to checker the stocks. By 1951, sales had slipped slightly back into the 30,000 per year range, although coming years would see times when over 50,000 rifles annually were produced.

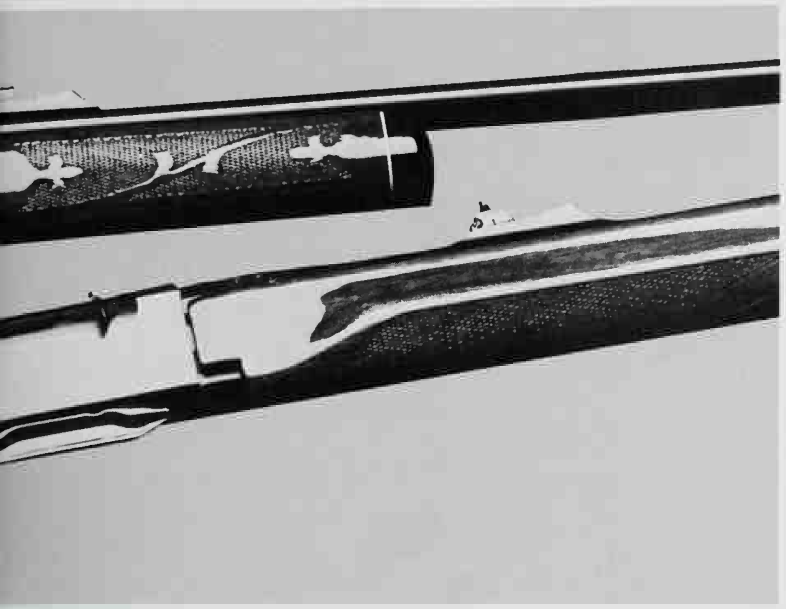
In 1962, the Remington model 700 was introduced, and it superseded the 721 and 722. Sales soared again, this time into the 60,000 per year category in the first year of production. Since that time, some years have seen over 100,000 of these rifles produced and sold. The Model 721/722 and their upgraded offspring, the Model 700, have set records as the best selling bolt action rifles in the world to this day.

One of the most interesting innovations generated by Remington Arms was that of the adjustable trigger. Up until the introduction of the Models 721 and 722, most rifle triggers were simply factory-set. But with the introduction of the new Remington rifles after World War II a new phase was coined in the every day usage of the firearms trade: 'The fully adjustable trigger.' This meant that the amount of effort required to pull the trigger in order to release the hammer could be adjusted according to taste. This is made possible via a secondary sear, located at the long end of the trigger lever, which allows the mainspring pressure to be drastically reduced. With only a small amount of pressure on this secondary sear, it is possible to maintain a small amount of contact with the mainspring. Small screws were mounted in the trigger housing which made it possible to adjust the limits of motion within the trigger mechanism—the weight of pull, creep, backlash and depth of sear engagement could be adjusted to suit sportsmen's finger reflexes. Naturally, Remington's competitors followed suit and virtually every deluxe new rifle which has been introduced since Remington's innovation has featured a fully adjustable trigger mechanism.

One objection that has been raised about the Remington Model 700 is that its extraction and ejection mechanism *looks* as if it's too small to be reliable—but looks can deceive. The extraction and ejection mechanism of a rifle is intended to clamp onto the spent shell and eject it from the breech when the bolt is pulled back. When one considers how a Remington Model 700 extractor works, apparent heftiness matters little. Remington extractors are somewhat unique: the more pressure is exerted on them, the tighter they hold onto the shell casing—this is the famous Remington 'ring of steel' bolt face extractor. The extractor derives its strength from the bolt itself and also cannot override the cartridge rim; when overriding takes place, the ejector gets 'stuck,' and fails to eject the spent cartridge. Remington put up with numerous complaints about their miniature extractors. Finally, their engineers concocted a tug of war test between a standard Model 98 Mauser extractor and the Model 700. The two rifle bolts were fitted into a laboratory setup which measured tensile strength. The machine ran the pressure on each extractor up to hundreds and then thousands of pounds. The Mauser extractor let go first. The Remington extractor was triumphant.



As early as 1874, Remington was involved in the fabrication of beautifully made, single shot target rifles. The American team won an international competition over a crack Irish team that year at Creedmoor, Long Island: the Irish team was fresh off a victory at Wimbledon, England which declared them to be the finest marksmen in the Western World! Important in this victory were specially built 'Creedmoor' long range rifles made for the American team by E Remington and Sons under the supervision of L L Hepburn. Today, Remington's 40-X target rifle stands at the top of the accuracy heap. Many consider the 40-X to be the most accurate center fire rifle ever offered by a major arms manufacturer. Its accuracy is legendary and even rivals the efforts of the best custom gun shops. Today every 40-X that leaves the Remington factory is virtually a dream come true.



But the accuracy game is not only played by bench rest shooters. Varmint rifles offer superb accuracy as well as conventional hunting features. One of the most accurate varmint rifles that can be had over the counter is the Remington 40-XB. This rifle comes in a variety of calibers from .22 up to .300 Magnum. The barrel is a heavy stainless steel tube. The 40-XB is available in both single shot and repeater models. Ultra-fine trigger pull is optional. Unlike other Remington firearms, 40-XB rifles are produced in Remington's custom shop and are hand built and tested. Each rifle is test fired for accuracy and the test targets are supplied with each rifle. The 40-XB stock profile and dimensions are beautiful to target and varmint shooters; the rifle is a stellar performer.

Remington also manufactures a very accurate varmint rifle known as the Model 700 Varmint Special, which is a variant of the Model 700 Sporter. Both the Model 700 Varmint Special and the 40-XB are direct descendents of the Model 722. The 700s are not custom built or fitted as are the 40-XBs, but they are remarkable for mass-produced weapons.

Shotguns

Remington began producing double-barrel shot guns with the Remington-Whitmore Model of 1874, which was actually a shotgun and rifle combination. This particular 'do-anything' gun was produced from 1874 to 1882, when an actual double-barreled shotgun was produced in both 10 and 12 gauge. In the middle 1890s, Remington upgraded its shotgun technology by marketing a hammerless gun from 1894 until 1900. In 1907 Remington introduced its Model 10A Standard Grade repeating shotgun with slide action. This particular model proved to be quite popular, and continued to be sold into the late 1920s. About the time that the slide action shotgun was introduced, Remington came up with the Model 11A Five Shot Autoloader. This was a hammerless shotgun of the Browning type, with a tubular magazine holding four shells and available in 12, 16 and 20 gauge. Remington did not, however, confine itself to slide action and autoloader shotguns only.

In 1932, the Model 32A Over-and-Under Gun was introduced. This hammerless double-barrel featured automatic ejectors—and later models even incorporated a selective single trigger mechanism. It was available in 12 gauge only, but in various barrel lengths (from 26 to 32 inches) and chokes. Production ceased about 1942. In 1973, Remington introduced the Model 3200 Field Grade Over-and-Under Shotgun, which continues in production today.

The Remington Model 870 is probably the most popular pump action shotgun of all time. In 1950, the first Model 870s appeared. These were five shot slide-action hammerless repeaters in various gauges, all of whose tubular magazines held four shells. Total sales are well over four million pieces. Pump action shotguns are generally used by those hunters who favor the reliability of manual operation especially in inclement weather and rough conditions. The 12 and 20 gauge 870s feature the interchangeable 'Rem Choke,' which is crafted from heat-treated seamless stainless steel and provides a wide variety of choke settings for the individual shotgun.

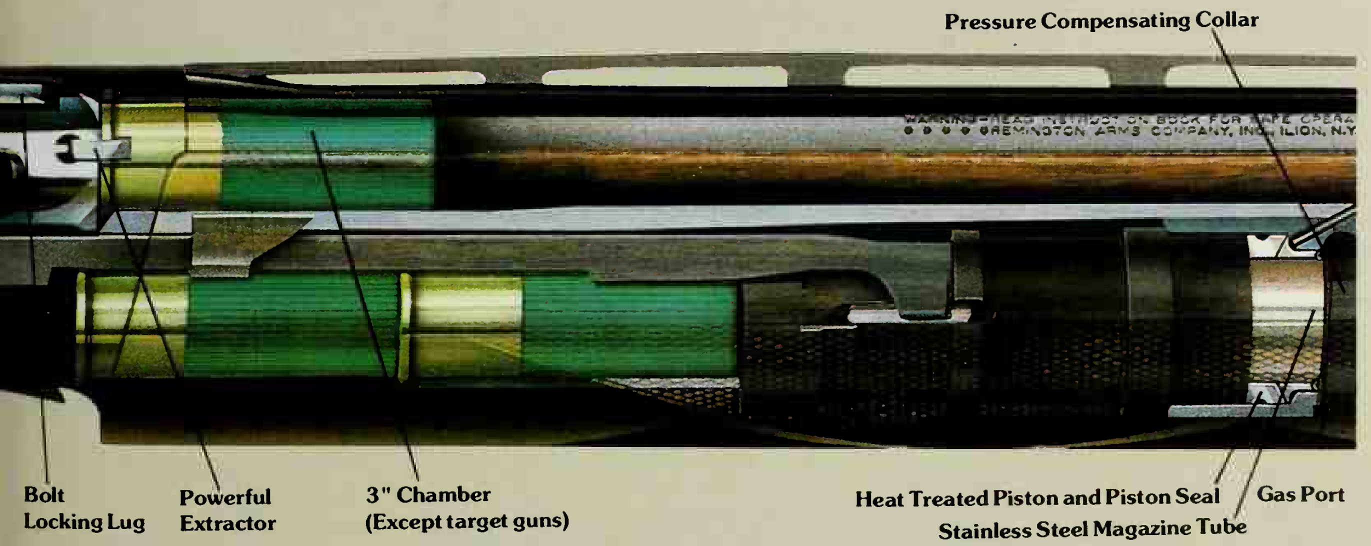
Today, the Model 870 Pump Action Shotgun comes in six varieties: the Wingmaster, the Special Field, the .410 Field, the Wingmaster Deer Gun, the 20 gauge Youth gun and the Express. There are also two special purpose 870s—namely, the SP Deer Gun and the SP Magnum.

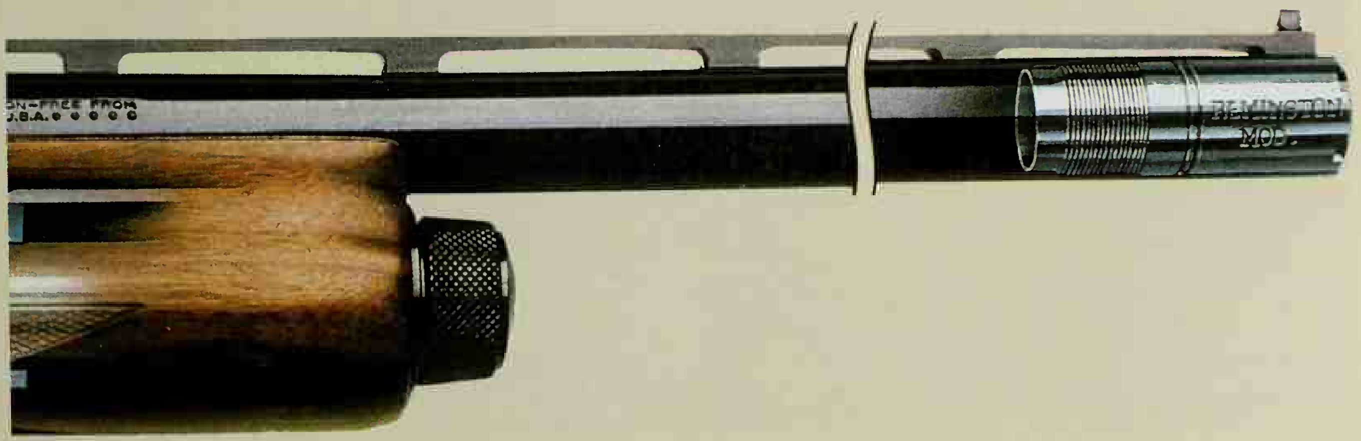
Probably the largest selling *automatic* shotgun of all time is the Remington Model 1100 Automatic Field Gun, which was first introduced in 1963. This gas-operated autoloader is noted for its balance and soft recoil. It is marketed today in three basic varieties: the Magnum, the Field Grade and the Special Field. An array of separately sold barrels of various lengths, chokes and chambers make it possible for the Model 1100 owner to put his gun to its best

***These pages, from the top down:* The Remington Model 7600 pump action; the Remington Model 4; the Model 40-XB-BR Benchrest rifle; the New Model 40-XB Kevlar Stock Varmint Special; the Model 40-XR Rimfire rifle; and the Remington Long-Range XR-100 Pistol.**

REMINGTON
IMP CYL..
REMINGTON
FULL..
REMINGTON

These pages, clockwise from far right: **A ghost view of a Rem Choke choke tube as screwed into a Remington shotgun barrel; Rem Choke variable choke system tubes and their fitting tool; a ghost view of the mechanism of Remington's great new Model 11-87 Premier autoloading shotgun; and a closeup of the deep cut checkering on the 11-87's American Walnut stock.**


Pressure Compensating Collar
WARNING—READ INSTRUCTION BOOK FOR SAFE OPERA
REMINGTON ARMS COMPANY, INC., ILION, N.Y.
Bolt Locking Lug
Powerful Extractor
3" Chamber (Except target guns)
Heat Treated Piston and Piston Seal
Gas Port
Stainless Steel Magazine Tube


REMINGTON
MOD.

use from upland game to flyaway shooting. The various Model 1100 versions are distinctively decorated with receiver scroll work, usually a high gloss finished stock, white spacers and the now-familiar diamond grip cap inlay.

The top-of-the-line Remington Autoloading Shotgun is presently the Model 11-87 Premier Autoloader, which utilizes a pressure compensating system which enables the shooter to use all loads—from heavy three inch Magnums to light 2.75 inch loads—interchangably. This particular gas system is completely self-cleaning. No matter how many rounds are shot, the compensating spring never has to be removed for maintenance. In lab tests, Remington has proven that its Model 11-87 is literally *twice as durable* as the most popular autoloader currently on the market. The 11-87 Premier features cut (not stamped) checkering and satin finish on an American Walnut stock. The Model 11-87 is also available in Special Purpose Deer Gun and Special Purpose Magnum models.

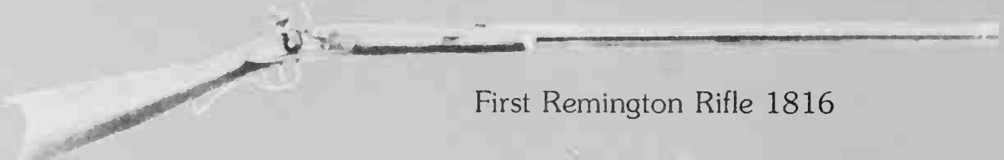
One of the newest innovations that Remington has introduced into the shotgun world is its SP MultiRange Duplex Shells. These shells are the first and only shotgun loads with a stratified payload; that is, heavier shot is loaded in front of lighter shot so that, when the shell is fired, the heavy shot breaks through any shot-deflecting brush and cover while the lighter shot retains its lethal energy for extended ranges. These multi-range shot shells are marketed in camouflage olive drab hulls with dull black bases. That this concept of two shot sizes in one shell is indisputibly effective is seen from a recent Remington test, in which new SP Duplex BBX4 shells were shot from 40 yards at a target moving 40 miles per hour. The resulting patterns showed 100 percent of the BB shot and 83 percent of the Number Four shot hit within a 30-inch circle. Most all of Remington's shotgun ammunition is available in both lead and steel shot.

Remington remains the only American ammunition company that also manufactures guns, and thus is able to tailor entire shooting systems to unique advantage, given the company's myriad ammunition product lines.

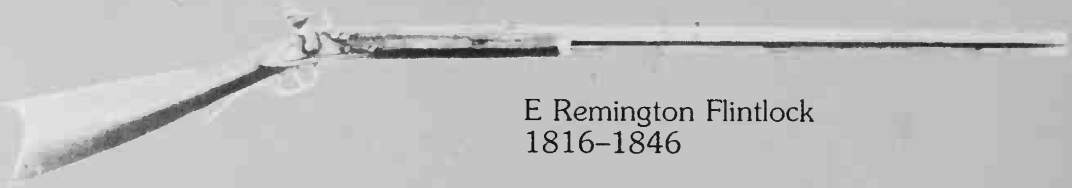
Remington
-1100

Below and bottom: **This beautiful Remington Model 1100 autoloading trap gun—shown here in 'flip side' views—belongs to proud owner Mr Don Griffith, who has shot it with pleasure for many years. Another avid trap and skeet shooter is Air Force General Curtis LeMay *(at right)*.**

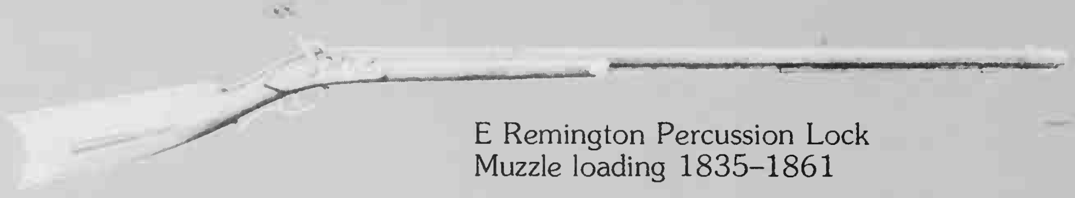
Remington Rifles 1816–1944



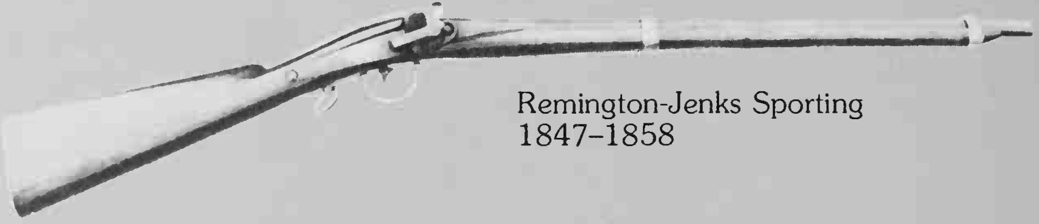
First Remington Rifle 1816



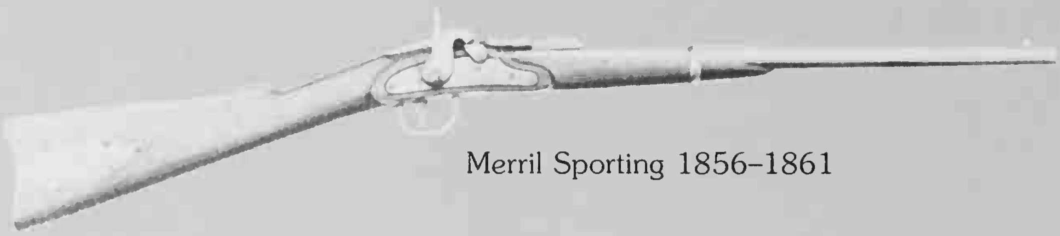
E Remington Flintlock
1816–1846



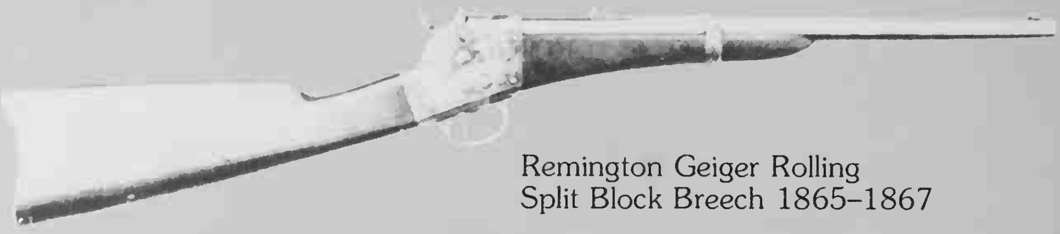
E Remington Percussion Lock
Muzzle loading 1835–1861



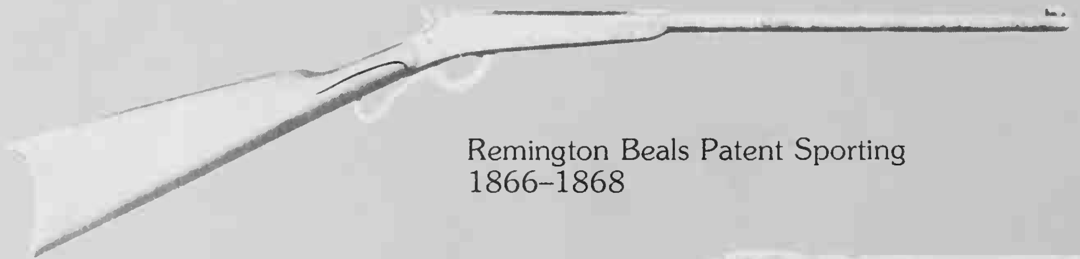
Remington-Jenks Sporting
1847–1858



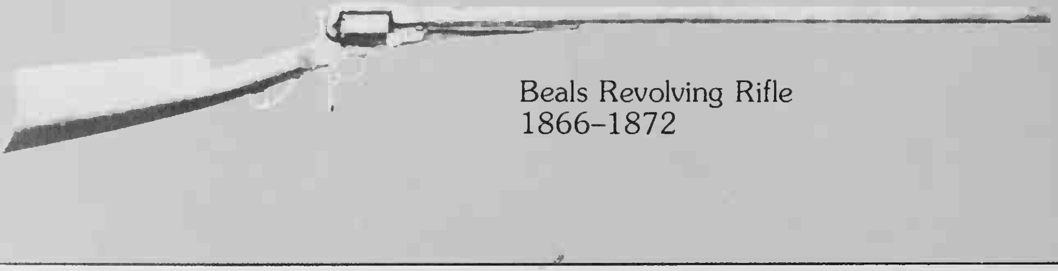
Merril Sporting 1856–1861



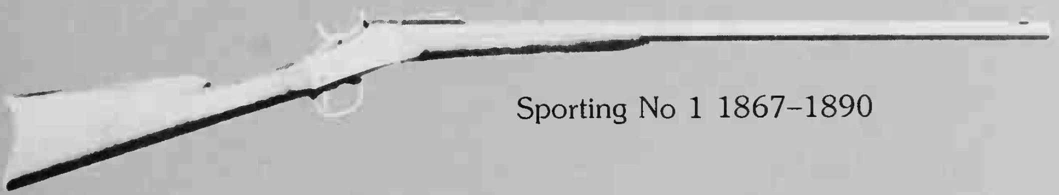
Remington Geiger Rolling
Split Block Breech 1865–1867



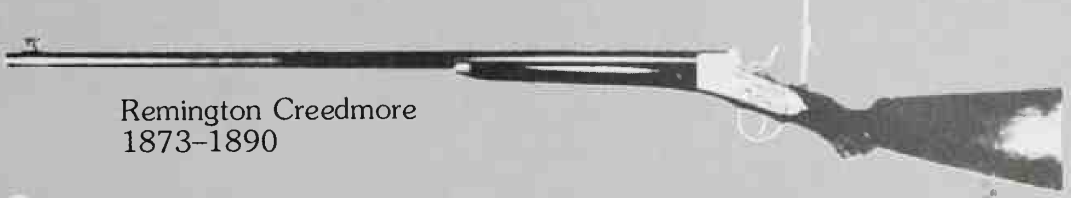
Remington Beals Patent Sporting
1866–1868



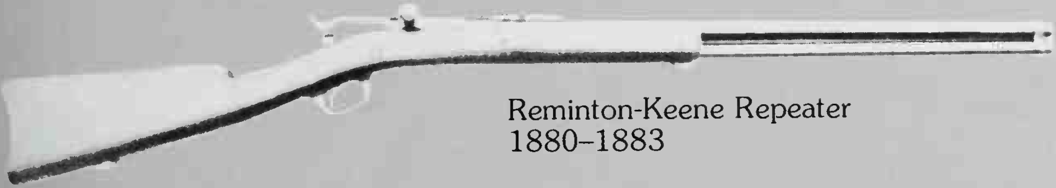
Beals Revolving Rifle
1866–1872



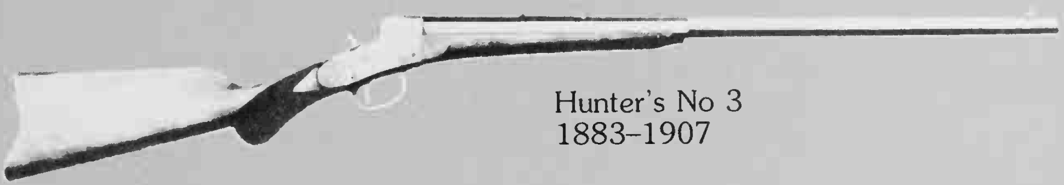
Sporting No 1 1867–1890



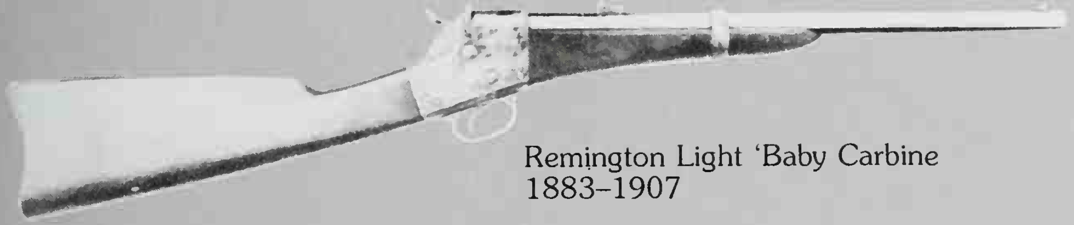
Remington Creedmore
1873–1890



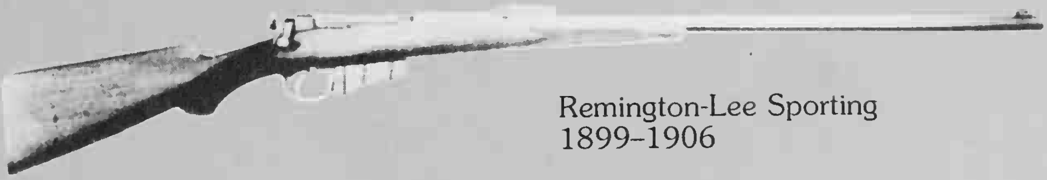
Reminton-Keene Repeater
1880–1883



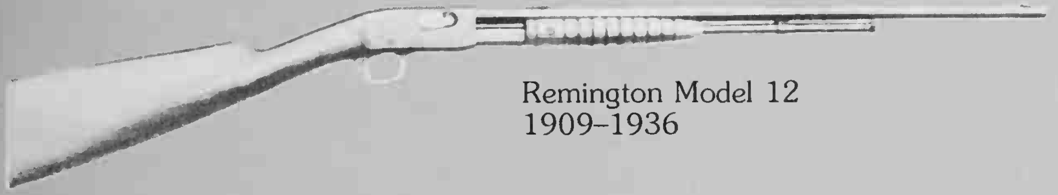
Hunter's No 3
1883–1907



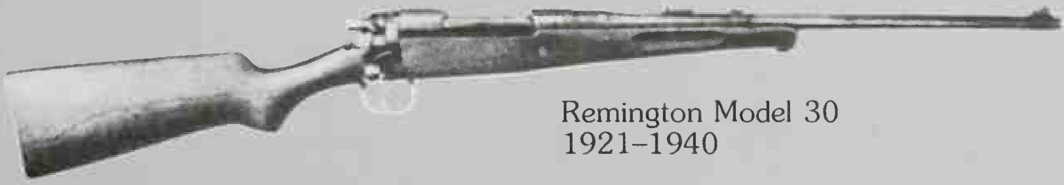
Remington Light ‘Baby Carbine
1883–1907



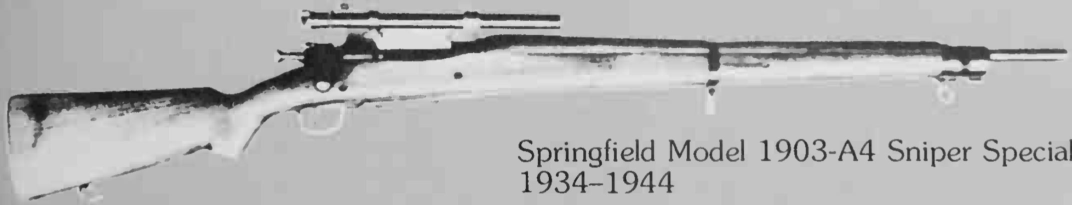
Remington-Lee Sporting
1899–1906



Remington Model 12
1909–1936

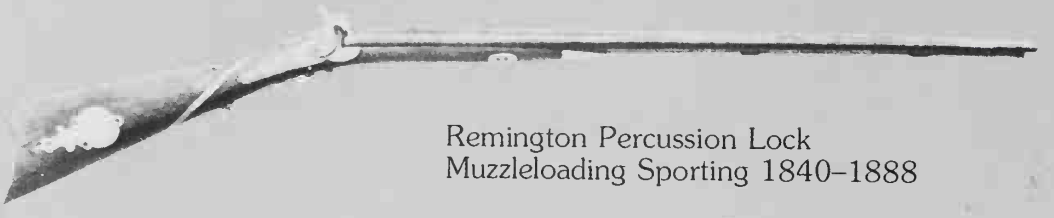


Remington Model 30
1921–1940

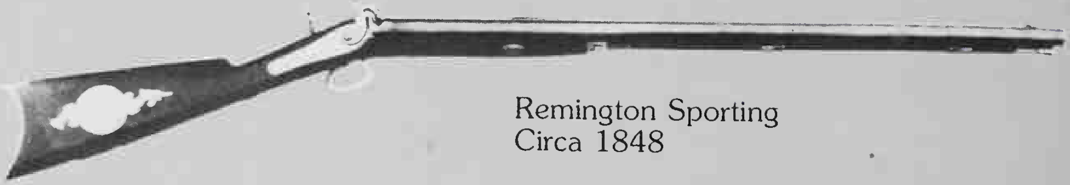


Springfield Model 1903-A4 Sniper Special
1934–1944

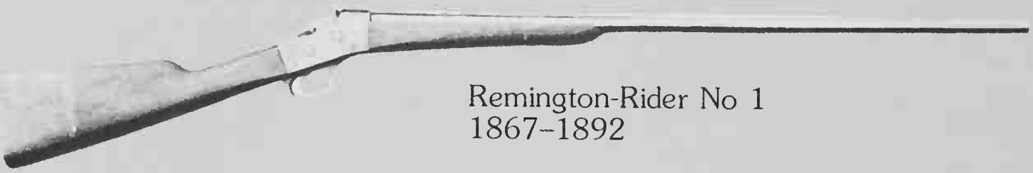
Remington Shotguns 1840–Present



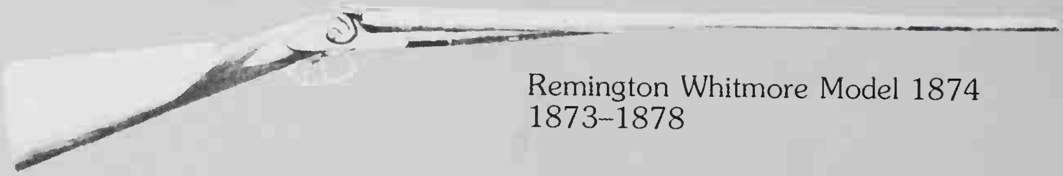
Remington Percussion Lock
Muzzleloading Sporting 1840–1888



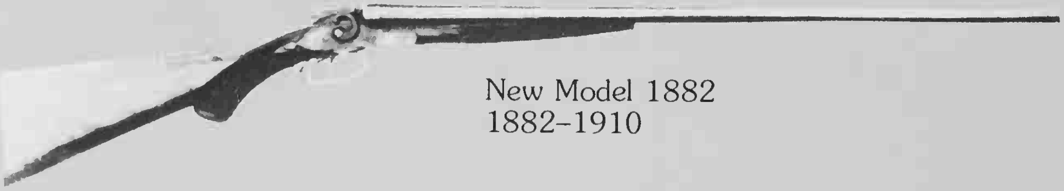
Remington Sporting
Circa 1848



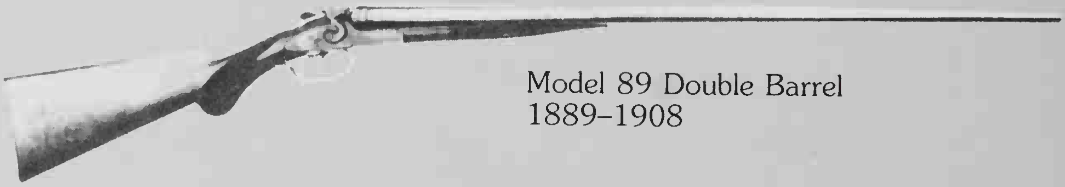
Remington-Rider No 1
1867–1892



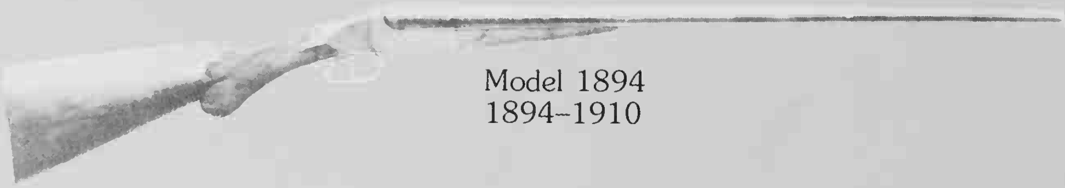
Remington Whitmore Model 1874
1873–1878



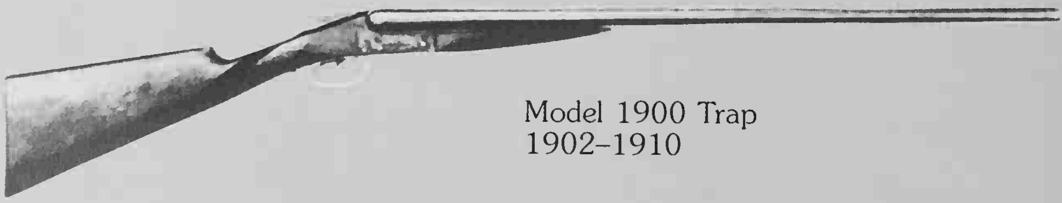
New Model 1882
1882–1910



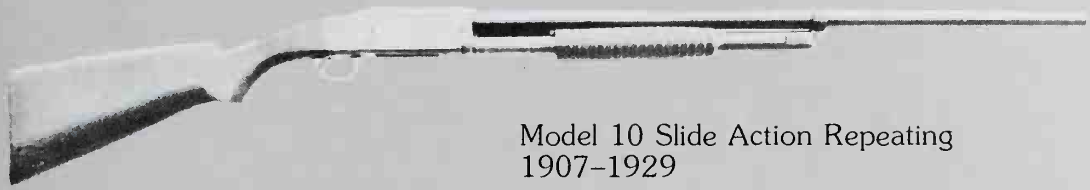
Model 89 Double Barrel
1889–1908



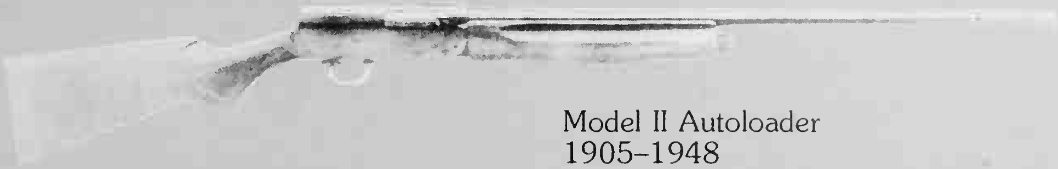
Model 1894
1894–1910



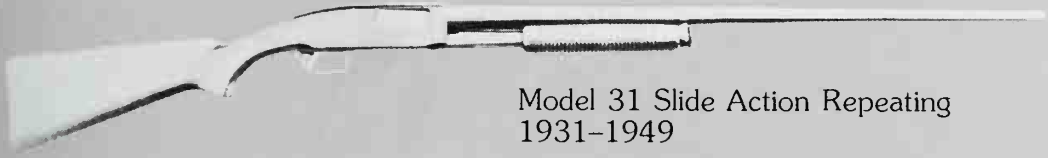
Model 1900 Trap
1902–1910



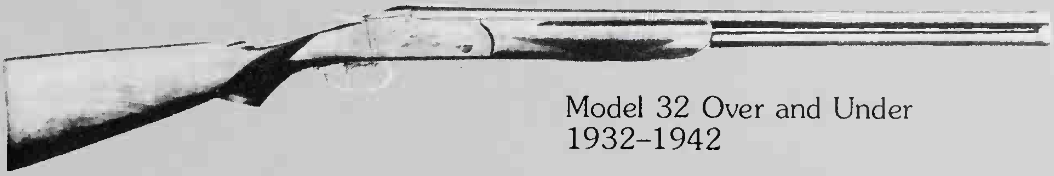
Model 10 Slide Action Repeating
1907–1929



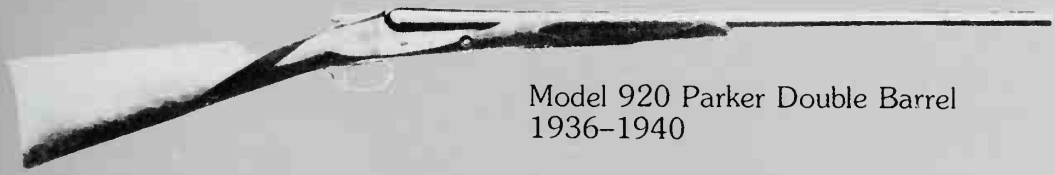
Model II Autoloader
1905–1948



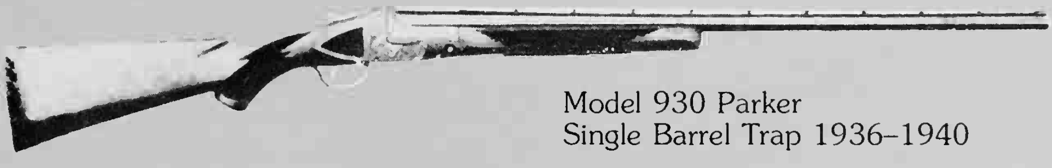
Model 31 Slide Action Repeating
1931–1949



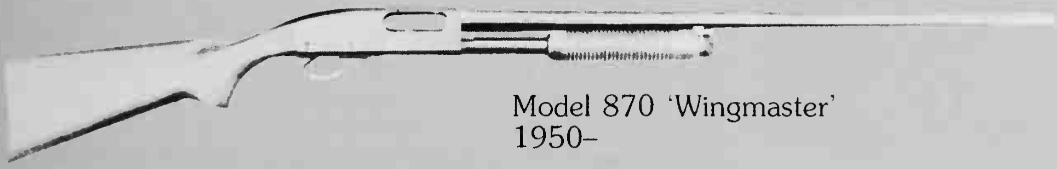
Model 32 Over and Under
1932–1942



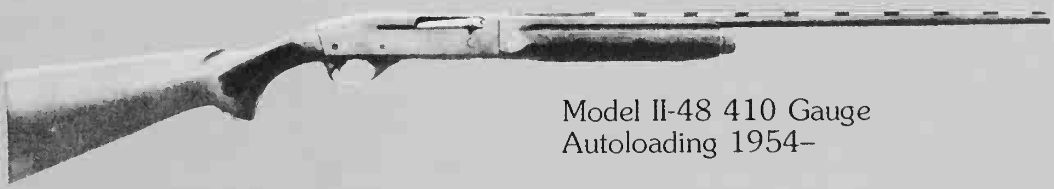
Model 920 Parker Double Barrel
1936–1940



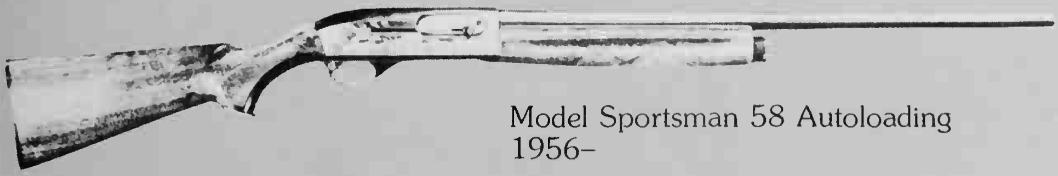
Model 930 Parker
Single Barrel Trap 1936–1940



Model 870 'Wingmaster'
1950–

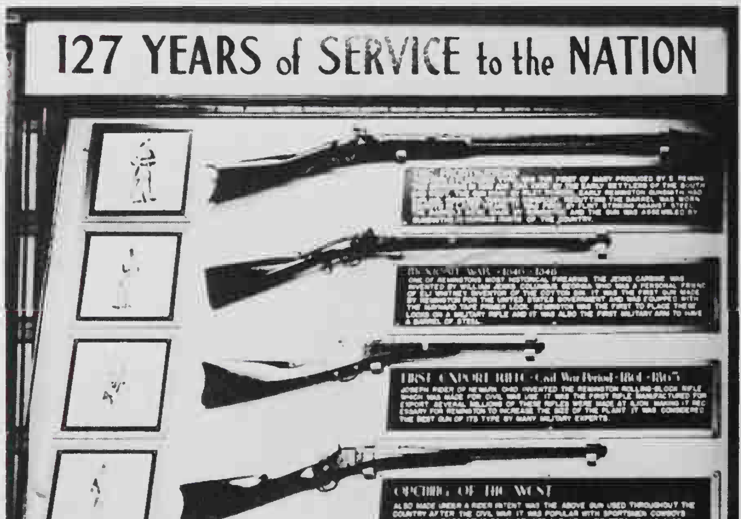


Model II-48 410 Gauge
Autoloading 1954–



Model Sportsman 58 Autoloading
1956–

Military



The same high quality that is evident in the sleek Model 7600 pump action rifle *(above)* has traditionally gone into Remington military arms. Remington arms have long had a central role in US history, as the display *at right, top to bottom* illustrates with one of 'Lite' Remington's flintlocks; a Remington-Jenks carbine; and developmental models of the legendary and far-famed Rolling Block rifle.

Arms

In 1845 the United States was preparing for war with Mexico. These preparations were hindered by circumstances in connection with the fact that the army was at that time equipped with muzzle-loading rifled muskets known as the 'Harpers Ferry Rifles.' These were to be produced by the John Griffiths Company of Cincinnati, Ohio, which held a contract from the government to produce 5000 units. The Griffiths Company was unable to fulfill its obligations on time; the government became understandably concerned, and let out the unofficial word to Eliphalet Remington that if he could see his way clear, the government would purchase rifles from him instead. Remington purchased the initial contracts from Griffiths and the government sweetened the deal by ordering an additional 5000 Harpers Ferry Rifles. Remington had to expand his facilities in order to meet this increased demand. He visited Chicopee Falls, Massachusetts and came in contact with the NP Ames Company. At this time, the Ames Company was turning out swords, bayonets and other military paraphernalia. Ames had also just contracted with the Navy for a new carbine invented by William Jenks. Remington bought the Ames Company, including all of its machinery, contracts and guns in various stages of production—as well as the services of his new-found friend, Mr Jenks. Jenks' original design was improved upon at many points. When finally delivered to the US Navy, the Remington-Jenks carbines were rifles with cast steel barrels, which were brightly tinned for protection against salt water, with hardened locks and breechs. The butt plate, trigger guard, sling rings, screws and other fittings were made of brass, polished to a high sheen. They were delivered to Commodore MC Perry's fleet in Vera Cruz in 1847, and were in the hands of his Marine troops when *they* stormed into the fabled Halls of Montezuma.

With the introduction of the Remington-Jenks carbine, the US Armed Forces were finally out of the musket age. A joint Army and Navy board said of the Jenks carbine, 'The board is of the opinion that this carbine combines, in an eminent degree, the two great advantages attending arms loading at the breech—that of propelling the ball with great force and that of being loaded rapidly and easily in situations where the use of the rammer is inconvenient; the later consideration would recommend it for use in boat service and in the fighting tops of vessels as well as in the Cavalry service.' But startling new inventions, even when they carry with them overwhelming advantages, are not always recognized by the 'authorities' in power at the time. Lieutenant Colonel George Talcott of the Ordnance Department was resolutely opposed to the Remington-Jenks rifles. In a letter to the Secretary of War he said: 'A prejudice against all arms loading at the breech is prevalent among officers, and especially the dragoons. That the arms of Mr Jenks, even if found better than others, can be introduced is not to be supposed. As regards the arming of the Second Dragoons with them, Colonel Twiggs has protested in advance against the use by his regiment of any breech loading or patent arms of any kind whatever.

'There are now Colts, Jenks, Hubbels, Nuttings—and I know not how many other kinds of patent arms—that they will ultimately all pass into oblivion cannot be doubted. I am, sir, etc, G Talcott, Lieutenant Colonel of Ordnance.' As it happened, Talcott and Twiggs were the only ones to pass into 'oblivion.'

Before the US military accepted the Jenks carbine, extraordinarily difficult requirements were imposed upon the Remington-Jenks carbines by the Ordnance Department. One of them was that the Jenks must fire 1500 times without any noticeable deterioration in its performance; the first such test went well until about the 1400th shot, when the nipple on the firing mechanism broke and the gun was subsequently turned down.

But Jenks knew that he had a good idea. He went to Europe and in England and France found governments that were more than willing to give him contracts. That the Europeans found the Jenks carbines very attractive caused the US government to awaken out of its close-minded slumber. In 1858, the Jenks carbine was redesigned to accept cardboard cartridges and was tested by the government once again. This time, the Ordnance Department tests consisted of firing the gun a mere 126 times. Then they loaded it, held it under water for a full minute, and set it aside. The next day the carbine was fired and, though rusted, no difficulty was encountered in putting 50 rounds through it.

By the latter 1850s, Remington was beginning to do an expanded business for other gunsmiths. In their catalogue for 1858, they stated that:

'We have acquired a practical knowledge of the gunmaking business, especially in the manufacture of barrels, which we believe few, if any others, possess, having during that time (40 years) tested a great variety of Iron for the purpose, but having mostly manufactured it ourselves expressly for our own use.

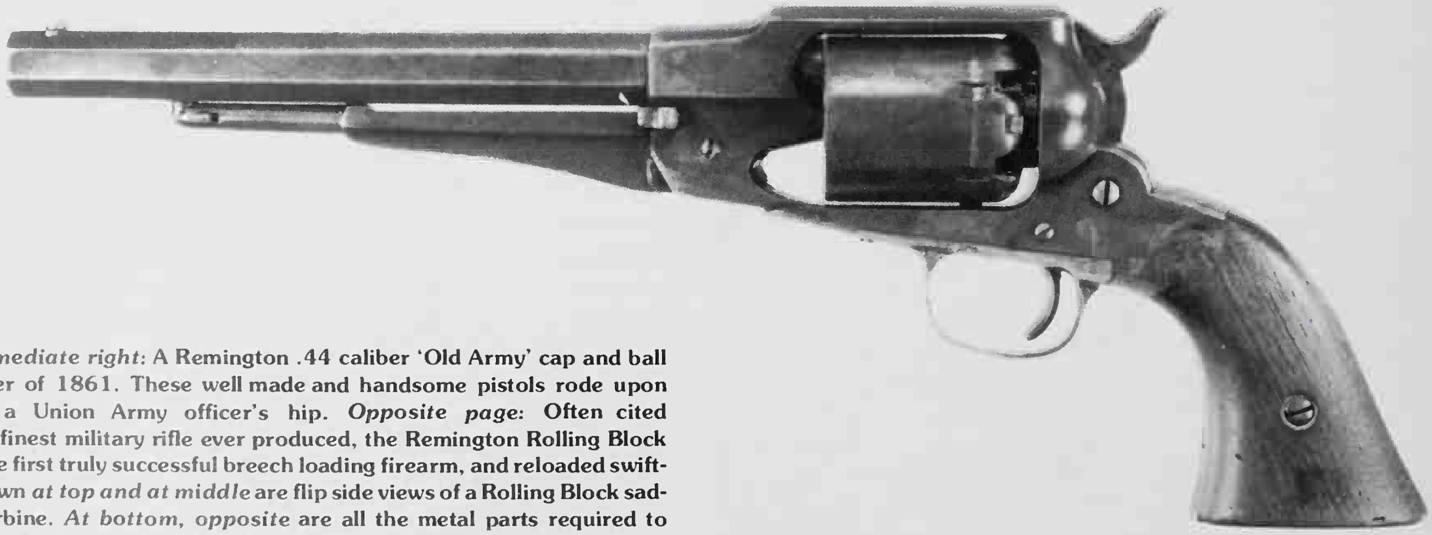
'We have also, for nearly 30 years, been testing the Steel of almost every manufacturer in the world, for our Cast Steel Barrels, and have for a long time had it made to our order expressly for that purpose.

'These repeated and long continued experiments, in procuring the proper material for every variety of Barrel, and an equally long experience in the various methods of working and annealing it, enable us to say, without boasting, that we are now prepared to make Barrels both of Iron and Steel in greater variety and perfection than any other Establishment in this country, if not in the world; having been first in successfully introducing Steel for Sporting Guns, and also for US Rifles and Carbines, and having recently manufactured about 15,000 such for the US Service.'

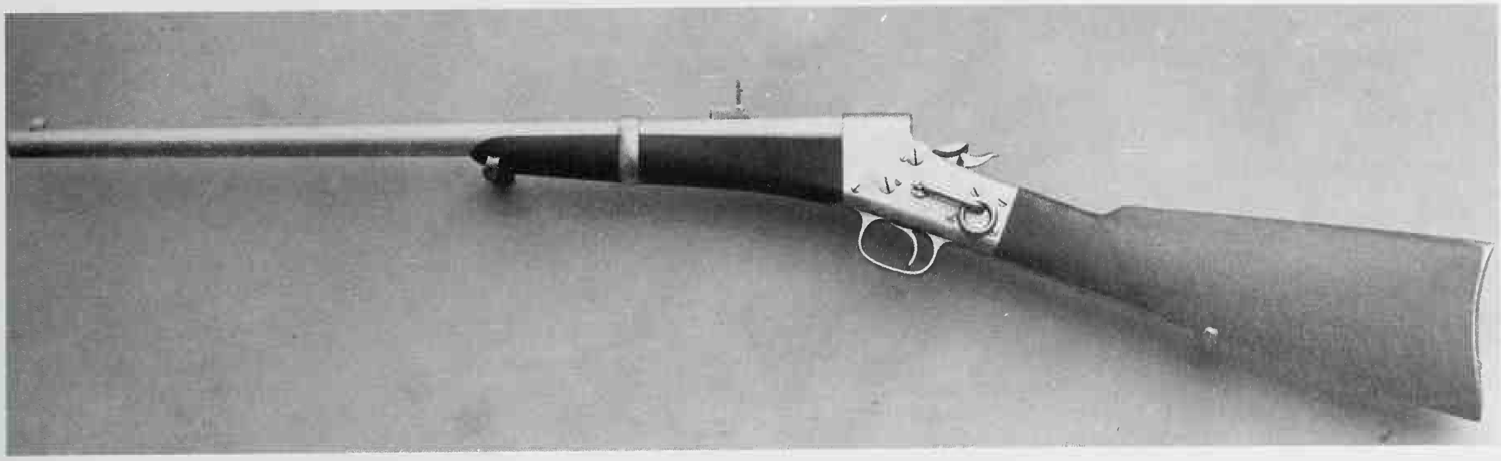
Prices at this time ran as follows: cast steel barrels, $3.00 each; iron barrels, $2.00 each, Stubbs Twist (Damascus) $4.00 each; and matched barrels for double guns, (cast steel) $6.50 per pair.

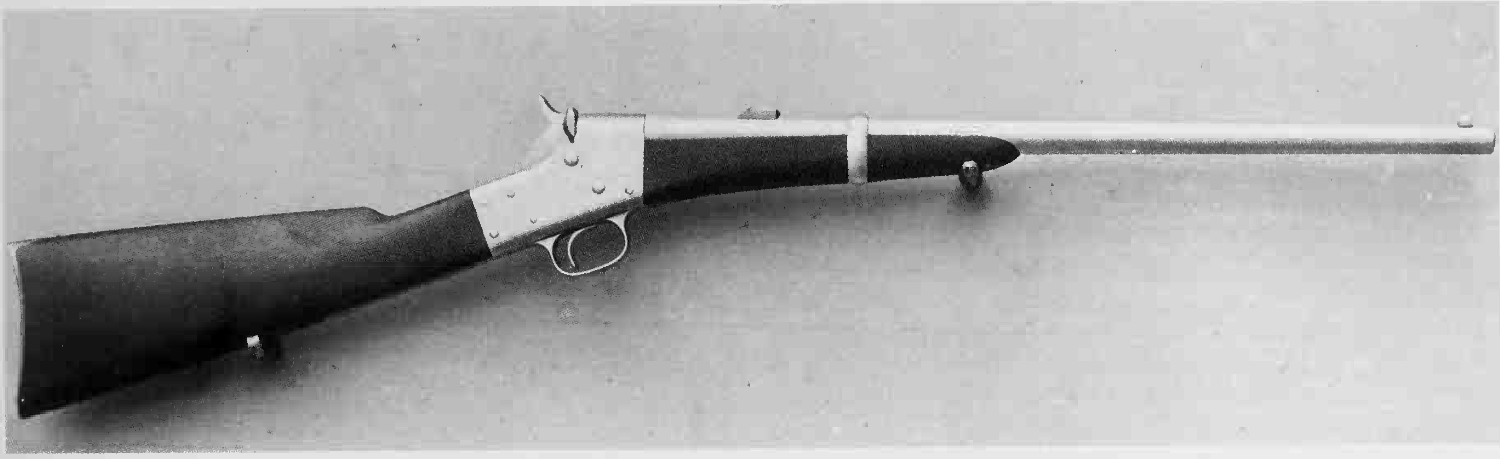
The advent of the Civil War found the Union in dire straights. At that time, the government ran only two arsenals—one at Springfield, Massachusetts, and the other at Harpers Ferry, Virginia. But Virginia had seceded from the Union with the advent of war, and the Harpers Ferry arsenal was destroyed in the first days of the conflict. This left the Union with only one arsenal—which could only turn out a few thousand rifles a year. The government turned to Eliphalet Remington with the question, 'How many guns, revolvers and bayonets can you make for us?' The answer to that initial question was astounding. Orders from the Army and the Navy eventually amounted to over $29 million—a staggering sum in those days. At its peak, Remington produced over 200 pistols and nearly 1000 rifles per day for the Union troops. Dropforged bayonets were also produced by Remington during the war; 18,000 Maynard percussion locks were also built and used for the conversion of 1842-vintage flintlock military muskets. A cartridge division of the company was set up which supplied almost 10 million cartridges (which were primerless packets, each containing gunpowder, wadding and a rifle or pistol ball) to the government. Other deliveries included over 125,000 Remington-Beals .44 caliber Army revolvers, 5000 Remington-Beals .36 caliber Navy revolvers and 20,000 carbines. Of course, the bullet molds, reloading tools and other accessories for these firearms were also fabricated by Remington.

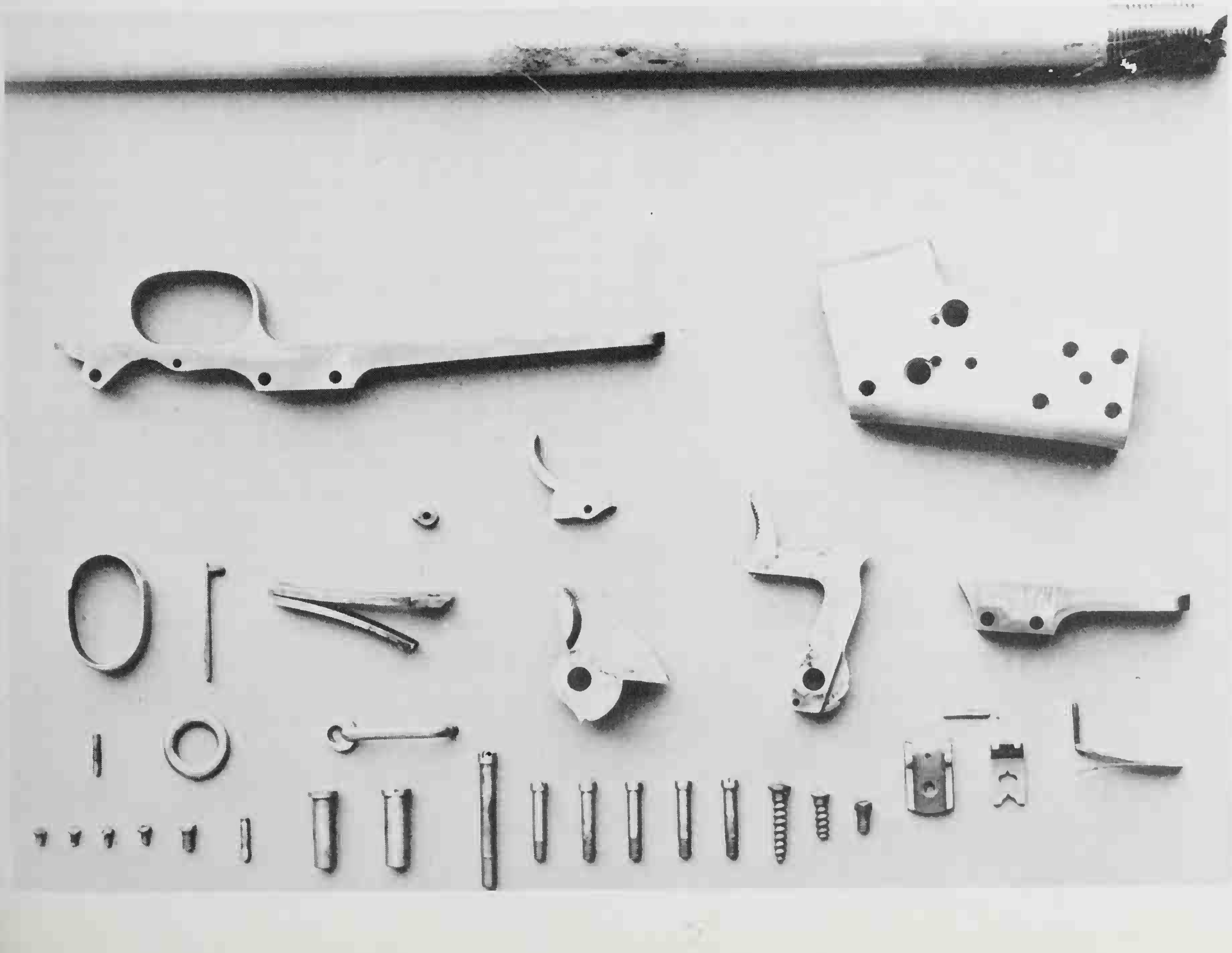
Such prodigious output of his factories naturally placed a severe strain on Eliphalet Remington himself. In August of 1861, his doctors diagnosed an inflammation of the bowels which today would be called an appendicitis attack. Overwork had simply caught up with him, and shortly before his death he dictated to his daughter, Maria, the following rather melancholy poem:



At immediate right: **A Remington .44 caliber 'Old Army' cap and ball revolver of 1861. These well made and handsome pistols rode upon many a Union Army officer's hip.** ***Opposite page:*** **Often cited as the finest military rifle ever produced, the Remington Rolling Block was the first truly successful breech loading firearm, and reloaded swiftly; shown** *at top and at middle* **are flip side views of a Rolling Block saddle carbine.** *At bottom, opposite* **are all the metal parts required to assemble a Remington Rolling Block—all that's wanting are the stocks.**







In manhood's strong and vigorous prime
I planted a young Linden tree
Near to my dwelling, which in time
Has spread its branches wide and free.

Oft I have viewed its healthful growth
With something like a parent's pride
Who sees the offspring of his youth
Grow to strong manhood by his side.

But now, old age has damped the flame
That glowed within me at that day
Energy and strength desert my frame
And I am sinking in decay.

But thanks! I've lived and long have shared
Health and vigor like this tree
And when I'm gone let it be spared—
A mute remembrance of me.

On 12 August 1861, Eliphalet Remington died. The business passed to Eliphalet's three sons, Philo, Samuel and Eliphalet, III. The sons continued in the footsteps of their father by importing promising inventors into the company. One such inventor was Leonard M Geiger, whose breech loading mechanism eventually became the basis for the famous Remington Rolling Block Rifle; however, the Geiger gun had a curious breech mechanism through which the hammer struck a rimfire cartridge. The Ordnance Department ordered 20,000 Geiger carbines, but since the Remington Armory was already awash with orders, these guns were manufactured by the Savage Company of Middleton, Connecticut under license from Remington. These guns were delivered in early 1865 and saw action in the last days of the Civil War. It is interesting to note that some of these Geiger carbines were equipped with small coffee grinding mills attached to the stocks; the Union army was not to be without its appropriate condiments around the campfire at night!

The Geiger carbines proved to be very successful against Confederate troops armed with ancient muzzle loaders. But because of the peculiar split-breech arrangement, certain weaknesses were noted in these carbines. An improved Geiger breech loader was presented to the board of the Springfield Arsenal in January of 1865. Competition tests were conducted including 65 other gunmakers—including Sharps, Roberts, Burnsides, Peabody and Henry—but it was shown that the Geiger gun needed further work.

Joseph Rider, in attempting to improve on Geiger's ideas, finally produced a gun that became known as the Remington Rolling Block Rifle. The Rolling Block breech was incredibly strong, easy to operate, and virtually foolproof. These single shot rifles have been praised as the best military arm ever produced. The breech was opened by simultaneously cocking the hammer and rolling the solid breech block straight back with the thumb. The backward motion of the block ejected the empty cartridge. A fresh round was shoved into the chamber, and the breech rolled forward and closed in one continuous motion. A locking lever secured the hammer while the gun was open and locked the breech after it was closed. The firing pin ran through a hole in the solid breech block, with the hammer striking against the back of the pin, as it projected slightly from the block, at the moment of firing. Because of the unique nature of this rolling block system, the greater the recoil, the more securely the mechanism was interlocked; it was literally impossible to blow out a Rolling Block breech—which was capable of handling any ammunition then available.

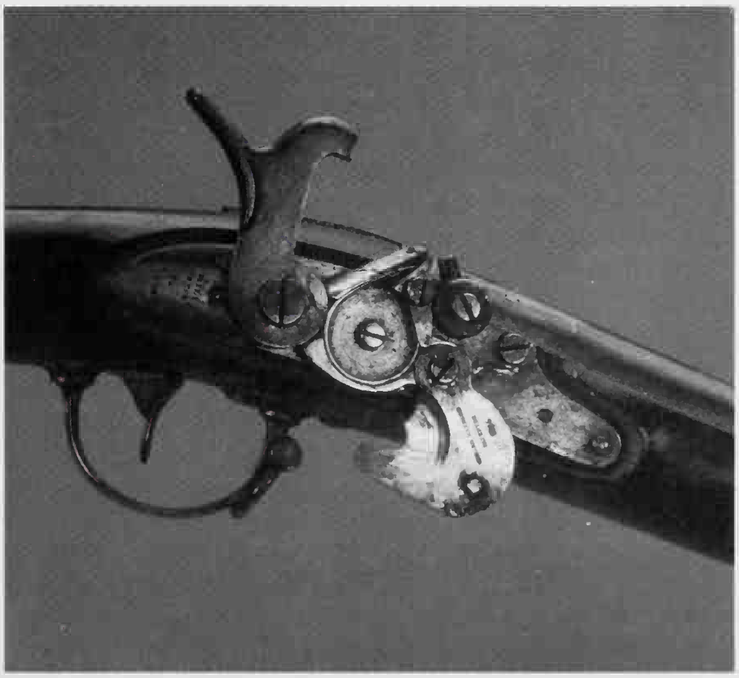
Both military and sporting Rolling Blocks were produced. There were over a million of the military models and carbines made. The total production of the Rolling Blocks spanned a remarkably long period of gunmaking history, from 1867 until 1934. The Rolling Block was produced in four basic action sizes: the Number 1 Action was the largest of the Rolling Blocks and was chambered for the largest and heaviest calibers; the Number 2 Action was chambered generally for cartridges of medium-size and pistol cartridges; the Number 3 Action was made in rimfire calibers of .22, .25-10 Stevens and .32; and the Number 4 Action was similar to the Number 1 in size and was designed for the 'smokeless high powered cartridges.' This last action was first introduced in 1898 especially for use with the then-new 'smokeless powder' cartridges, and was the last of the large frame Rolling Blocks.

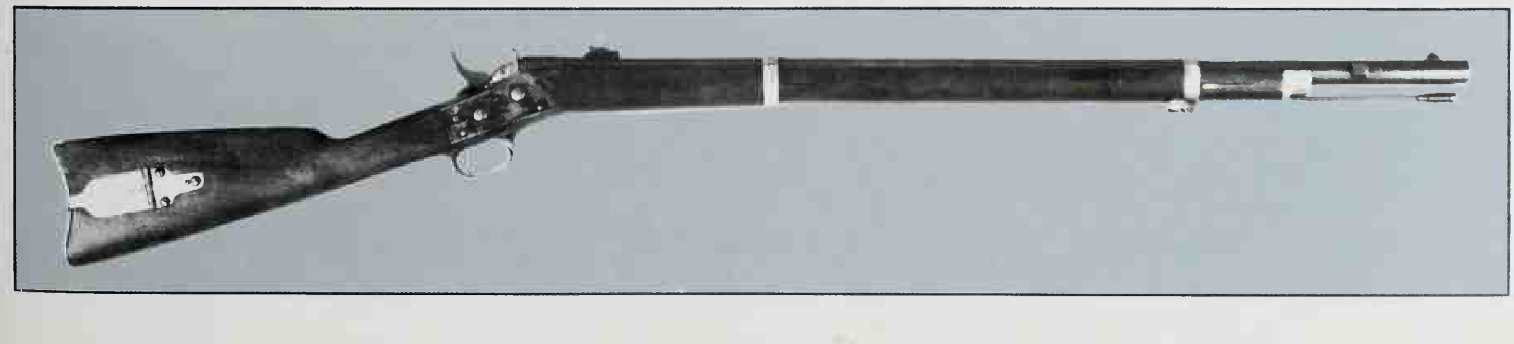
The claim that the Rolling Block action was by far the strongest in the world was not lightly made. According to the report of Alphonse Polain, director

At immediate left: **Another view of the (properly termed) Remington-Beals Old Army revolver. Remington manufactured over 125,000 of these eight-inch barrel six shooters. *Below:* A Maynard tape primer system is seen in the tape loading position on this Remington contract made Civil War musket. *At bottom of page:* This is a successful conversion—of a Remington percussion Zouave Rifle of 1863—to the famous Rolling Block action.**

of the proving house at Liege, Belgium, a .50 caliber Remington Rolling Block was loaded with 750 grains of powder (10 times the normal load), 40 balls and two wads. It was fired and the report states that ‘nothing extraordinary occurred.’ The Spanish government tested Remington Rolling Blocks by soaking them in sea water and then setting them aside to rust. When they were eventually fired, every metal part was coated with a thick film of corrosion but the mechanisms worked flawlessly. Various examining boards in different countries came up with incredible tests to which to subject the Rolling Blocks—the guns were fired over 2500 times continuously; stocks were removed and the guns were fired without them; metallic cartridges were filed down so that they would burst in the chamber; and ram rods were left in the barrels and shot out of them. Never a breech failed. Never a gun burst. All functioned perfectly. *Iron Age Magazine* of 7 March 1872 stated:

‘The excellent shooting qualities of the barrels made at E Remington and Sons have been, from the era of the founder, a proverb in mouths of wisest censure. The superiority has been, moreover, quite as generally observed in the barrels of the military as of the sporting rifles. It is possible that a degree of this excellence may be due to the choiceness of material, but the extraordinary care given to the interior finish, the delicate gauging of the chambers, and the exact turning of the muzzles, and more than all, the patient and faithful straightening process, which is never neglected, are probably the general claimants in this instance... The Remingtons, with an honorable pride in the excellence of their production, and correctly estimating the superlative importance of this quality in a barrel, have omitted no care, whether it concerns the experience and skill of artisans, or the severity of intermediate and final inspection, that will secure the merit of precision for their work.’ By 1872, the Remington Armory was capable of turning out 1500 guns in a single day, all to exacting standards of quality. After the Civil War, the American arms market had slowed significantly. This was not the case, however, in most European capitals. European generals had studied the Civil War with meticulous care, and learned that muzzle loading arms were a thing of the past. But neither the Prussian Needle gun nor the French Chassepot—which were both breechloaders—could begin to compare with the new American single shot rifles. Opportunity knocked at Remington's door. The two other Remington brothers readily agreed that Sam was their best salesman. His personality was warm and charming. He was socially polished and witty. His *savoir vivre* would make him an instant hit in the extremely exclusive social circles of Europe, and could



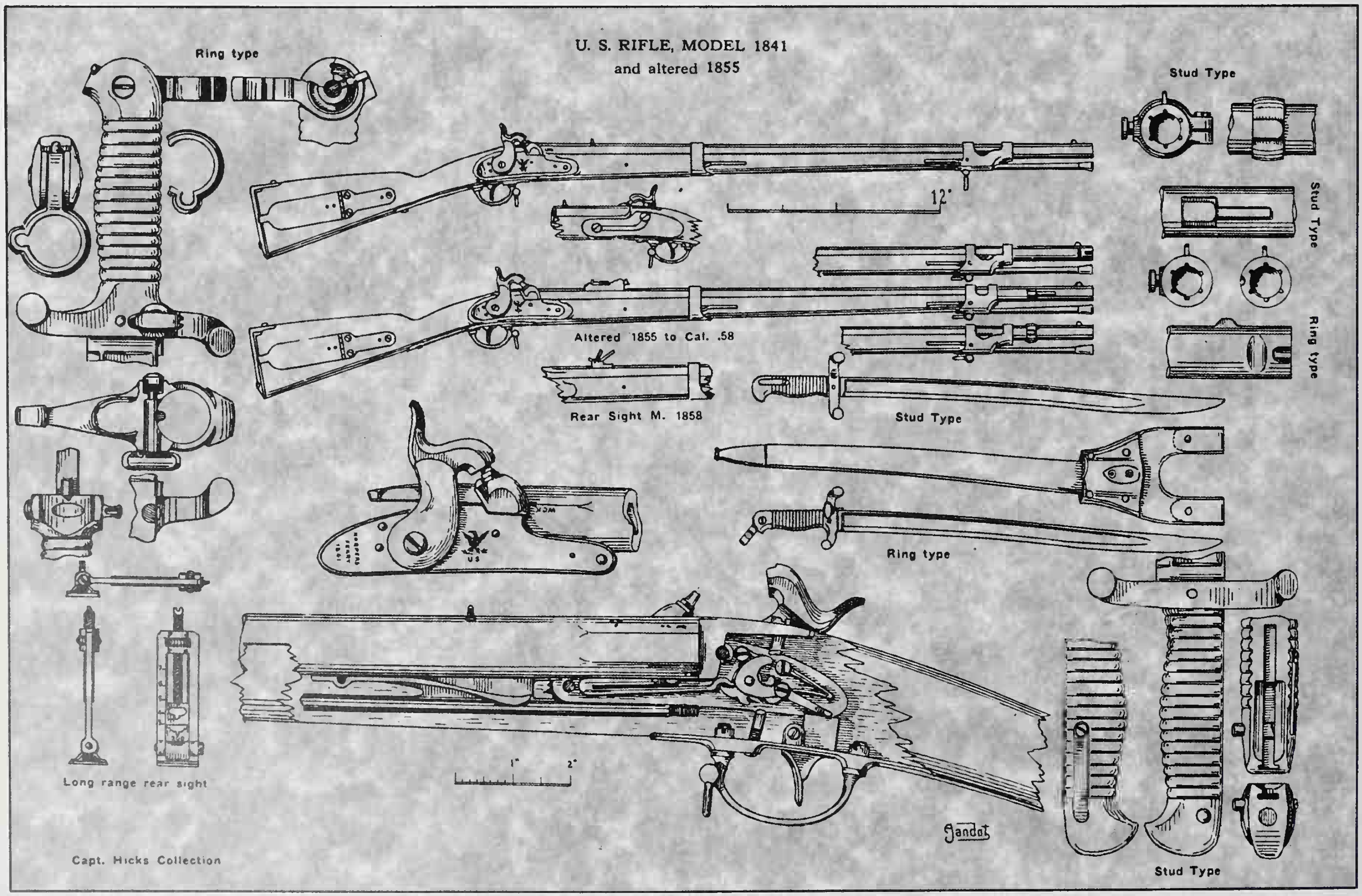


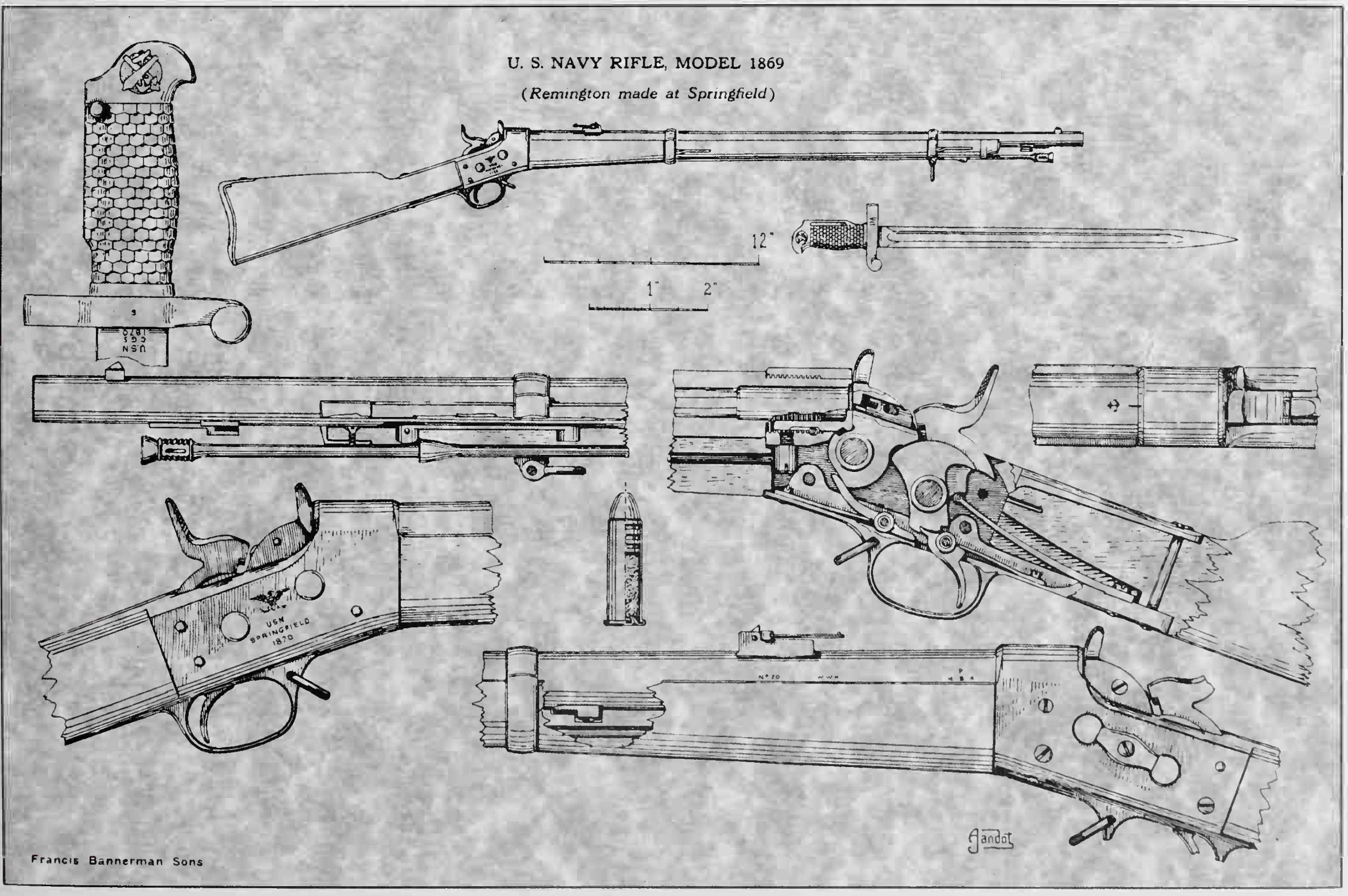
win for the company many valuable contracts totalling millions of dollars. So that Sam could better deal with European royalty, he was elected president of E Remington and Sons in 1866. He sailed to Europe with his wife, Flora, and established headquarters in Paris, where he lived in opulent style. While upper class European society—and particularly, the royal houses—normally excluded tradesmen and industrialists from social events, the makers of firearms were welcomed with open arms. Sam was entertained in most of the royal palaces of Europe and his company's product, the Rolling Block rifle, was eagerly received by kings and military leaders alike.

However, not all of Sam Remington's endeavors met with success. Sometimes an excellent product backed by good salesmanship simply falls victim to sheer misfortune. The Prussian army had decided that the Remington Rolling Block rifles were the guns for them. Accordingly, Sam was invited to their maneuvers near Potsdam. Sam arrived on the scene resplendent in silk hat, Prince Albert coat, and riding a beautiful charger. The King of Prussia, soon to become Kaiser Wilhelm I, welcomed Sam graciously with the request that he would like to personally shoot Sam's rifle. Sam handed the piece to the king, confident of his majesty's approval. The king adjusted the sights, took careful aim at an oak tree about 100 meters away, and pulled the trigger. Nothing happened! A dud cartridge! Lady Luck had betrayed him! The king hurled the gun to the ground in a rage and galloped away leaving Sam Remington to muse upon the furies of Fate.

Remington's losing streak did not last long. At the Imperial Exposition of 1867 in Paris, the High Commission of Firearms unanimously selected the Remington Rolling Block Rifle as the best rifle in the world. The exposition's judges consisted of leading ordnance experts from France, England, Austria, Russia, Prussia, Spain, Italy, Sweden, Holland and Belgium. They awarded Sam Remington the Silver Medal, which was the highest award for both military and sporting firearms. Shortly after this, Ismael Pasha, the great Khedive of Egypt, sent a commission to France to inquire about the latest firearms with which to equip his new Egyptian Army. The Egyptian Commission called on Samuel Remington, who immediately set sail for Cairo to see Khedive Ismael Pasha. A close, personal friendship evolved between them. Khedive Ismael Pasha gave Sam an ancient scimitar of Damascene workmanship. What really impressed the Khedive was the fact that the guns specified in the contract actually arrived on the specified date—such efficiency was a rarity indeed, and must not go unrewarded! Sam Remington found himself owning a parcel of land in the most desirable residential district of Cairo. The only problem with such a gift was that when a parcel of land was given as a gift, the receiver was obligated to build on it or else be guilty of unforgivable discourtesy. Sam built an exquisite marble palace on this piece of property, but never

Below: **Patent drawings for a US Army rifled musket. Remington made many similar arms for the Union during the Civil War.** ***Below right:*** **Patent drawings for the Remington Rolling Block rifle.** ***At right:*** **Late 19th century Remington arms displays, ready for shipping to firearms expositions around the world.**





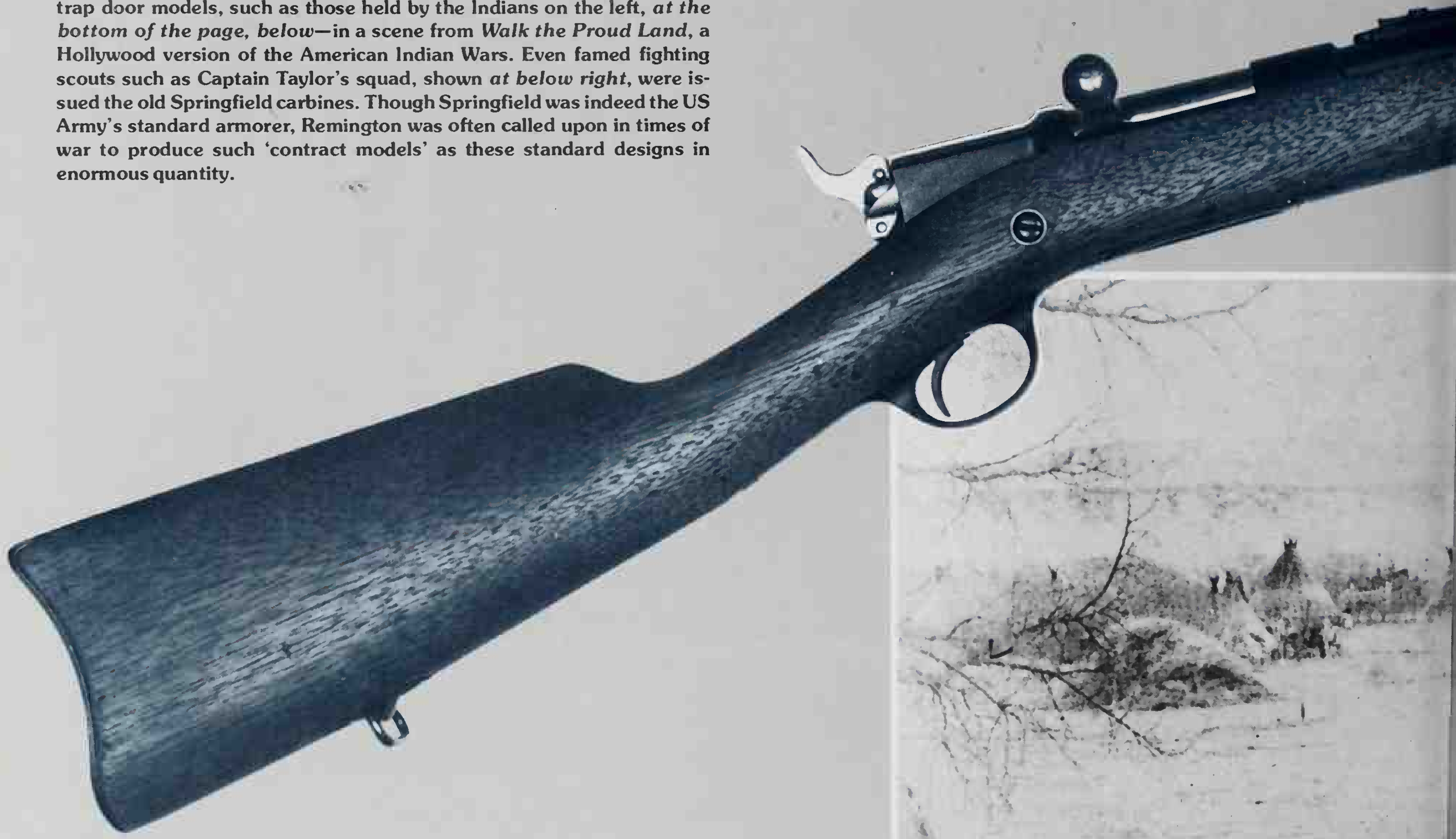
U. S. NAVY RIFLE, MODEL 1869

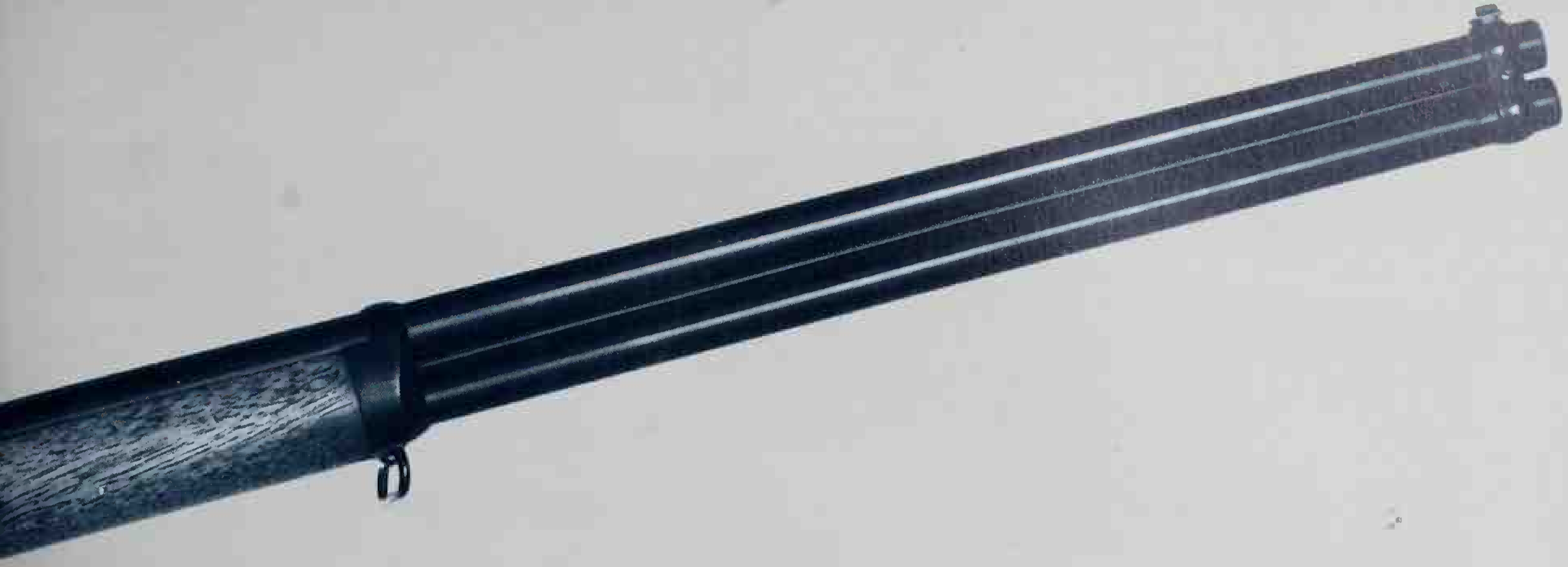
(Remington made at Springfield)

12"
1"
2"
USN
SPRINGFIELD
1870
Gandot

Francis Bannerman Sons

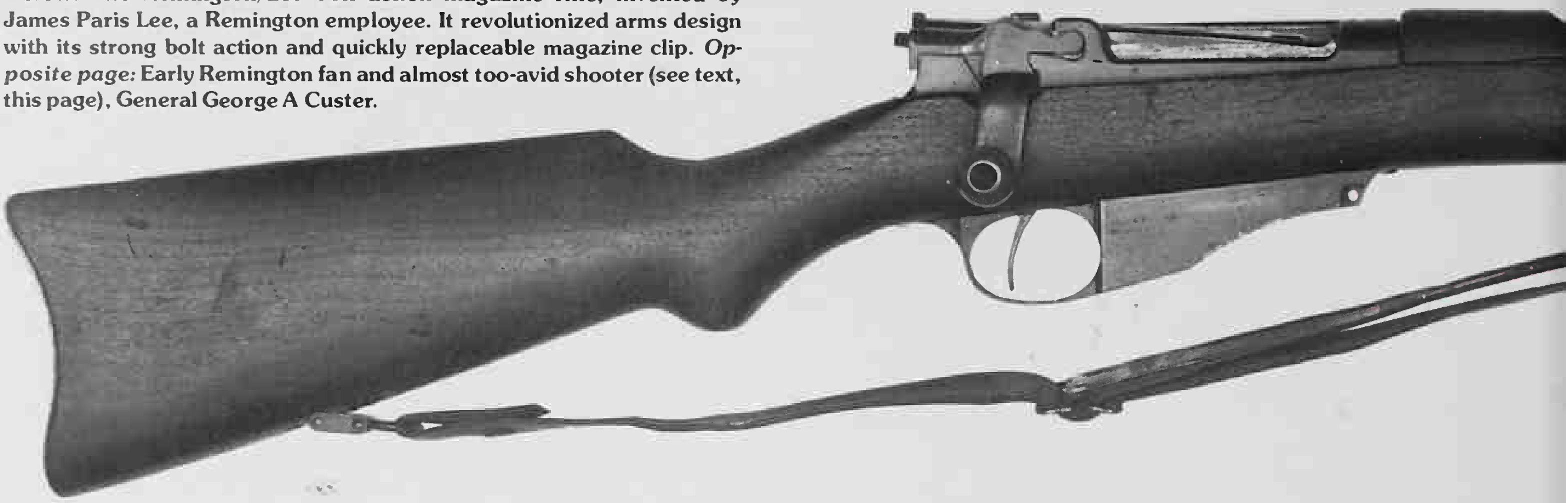
Remington and the armament of the Indian Wars of the Old West. The lot of the US Cavalry soldier just got better and better weapons-wise; many were issued Remington Rolling Blocks, and eventually light armament evolved to include the bolt action, tubular magazine Remington/Keene rifle, such as is shown *immediately below*—which reloaded fast and held enough ammo in its magazine to preclude reloading with any frequency. The capacious tubular magazine which was located under the barrel of the Remington/Keene contained a long spring which pushed the ammo backward toward the breech, where, as a round was fired and its spent case ejected, another round was fed into the chamber for firing. However, most Indian scouts were supplied with single shot Springfield trap door models, such as those held by the Indians on the left, *at the bottom of the page, below*—in a scene from *Walk the Proud Land*, a Hollywood version of the American Indian Wars. Even famed fighting scouts such as Captain Taylor's squad, shown *at below right*, were issued the old Springfield carbines. Though Springfield was indeed the US Army's standard armorer, Remington was often called upon in times of war to produce such 'contract models' as these standard designs in enormous quantity.





Indian Scouts

Below: The Remington/Lee bolt action magazine rifle, invented by James Paris Lee, a Remington employee. It revolutionized arms design with its strong bolt action and quickly replaceable magazine clip. *Opposite page:* Early Remington fan and almost too-avid shooter (see text, this page), General George A Custer.



found opportunity to live in it. After his death it was sold to the British Government, who used it until 1952 to entertain VIPs in Cairo.

Historically speaking, one of the most interesting tributes to the virtues of the Remington Rolling Block rifles comes from none other than General George Armstrong Custer. In 1872, the General had purchased a beautiful Remington Sporting Rifle of the finest (F) grade for which he paid $91.50. Apparently he felt that he got his money's worth because he wrote to the Remingtons:

'Headquarters Fort Abraham Lincoln, DT
October 5, 1873

'Messrs Remington & Sons:

Dear Sirs—Last year I ordered from your firm a Sporting Rifle, caliber .50. I received the rifle a short time prior to the departure of the Yellowstone Expedition. The Expedition left Fort Rice the 20th of June, 1873, and returned to Fort Abraham Lincoln, September 21, 1873. During the period of three months I carried the rifle referred to on every occasion and the following list exhibits but a portion of the game killed by me: Antelope 41; buffalo four; elk four; blacktail deer four; American deer three; white wolf two; geese, prairie chickens and other feathered game in large numbers.

'The number of animals killed is not so remarkable as the distance at which the shots were executed. The average distance at which the 41 antelopes were killed was 250 yards by actual measurement. I rarely obtained a shot at an antelope under 150 yards, while the range extended from that distance up to 630 yards.

'With the expedition were professional hunters employed by the Government to obtain game for the troops. Many of the officers and men also were excellent shots, and participated extensively in hunting along the line of march. I was the only person who used one of your Rifles, which, as may properly be stated, there were pitted against it breech-loading rifles of almost every description, including many of the Springfield breechloaders altered to Sporting Rifles. With your Rifle I killed far more game than any other single party, professional or amateur, while the shots made with your rifle were at longer range and more difficult shots than were those made by any other rifles in the command. I am more than ever impressed with the many superior qualities possessed by the system of arms manufactured by your firm, and I believe I am safe in asserting that to a great extent this opinion is largely shared by the members of the Yellowstone Expedition who had the opportunity to make practical tests of the question.'

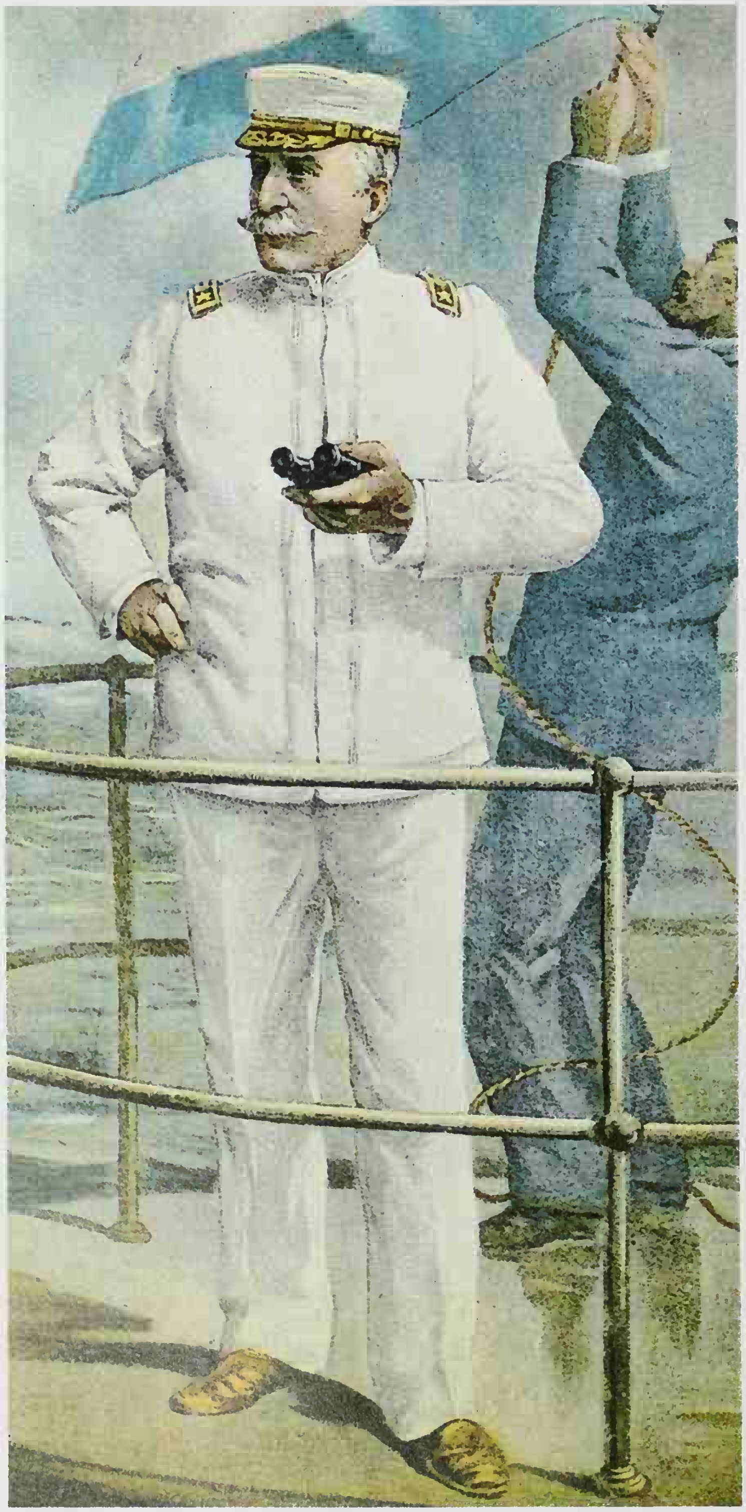
I am truly yours,
GA Custer
Brevet Major General US Army

During the 1870s and 1880s, the best military weapons in the hands of world armies were still single shot affairs. It was seen that a great improvement could be made by devising a means of better facilitating the loading and ejection of cartridges from rifle breeches. Many mechanisms were invented to meet this end, but few were successful. At first, a magazine-type box was mounted on the side of the rifle, thus allowing the soldier to quickly find his ammunition supply. Later small springs were incorporated into these magazine boxes to allow the shells to be sprung upward as needed. It was not long before the idea caught on of mounting this spring-loaded box beneath the rifle and incorporating it somehow into the breech loading mechanism of the arm, thus creating a new type of repeating rifle. At first this sounded simple, but proved to be somewhat complex to achieve. Various masterpieces of mechanical complication were devised, none of which attracted the favor of military men. It remained for James Paris Lee, a Scottish-born American who worked for Remington, to do the job.

Lee's design was the ultimate in simplicity. The receiver was cut away underneath and a detachable sheet metal box was inserted through the bottom of it. The cartridges rested on an 'elevator' of sorts within this box, or 'magazine,' which was a loaded zig-zag spring. A spring catch held the magazine in place once it was pushed into the rifle. When the bolt was opened, the magazine spring moved a cartridge upward into the receiver. As the rifle bolt was closed, the cartridge was pushed forward into the chamber ready for firing. Soldiers could carry fully loaded magazines on their belts, and were availed of much faster reloading, and thus a greater rate of fire than ever before.

James P Lee was in fact one of the most brilliant of

all the inventors who had worked for the Remingtons. While still employed by the Winchester Arms Company, he had developed a refinement to the lever action repeater which replaced the Winchester Model 73. But he wanted to work at his own ideas for a bolt action magazine rifle, so he came to Philo Remington—who recognized talent, and gave him an entire workshop in the Armory and all of the technical assistance that he needed. Lee patented, on his own, the box magazine in 1879 and Remington began to manufacture the Remington/Lee rifle in 1880. Structural weaknesses in the breech resulted in several fatal shooting accidents, and these weaknesses were remedied. It is a testimony to the soundness of Lee's idea that the design was carried on, even with such early tragedy. Lee eventually perfected the design and made it one of the safest guns in the world. Remington made the Remington/Lee rifle for the Lee Arms Company, which the inventor had organized as a selling agency. In 1884 Lee entered into an agreement with the Remingtons to both manufacture and sell his gun on a royalty basis. But by this time E Remington and Sons was in dire financial straits and eventually went into receivership, upon which Lee recovered the rights to his gun. Later, the British adopted the Lee system, in the form of the famous Lee/Enfield Rifle. This weapon was the standard arm of the British infantry for more than 50 years, even into World War II.

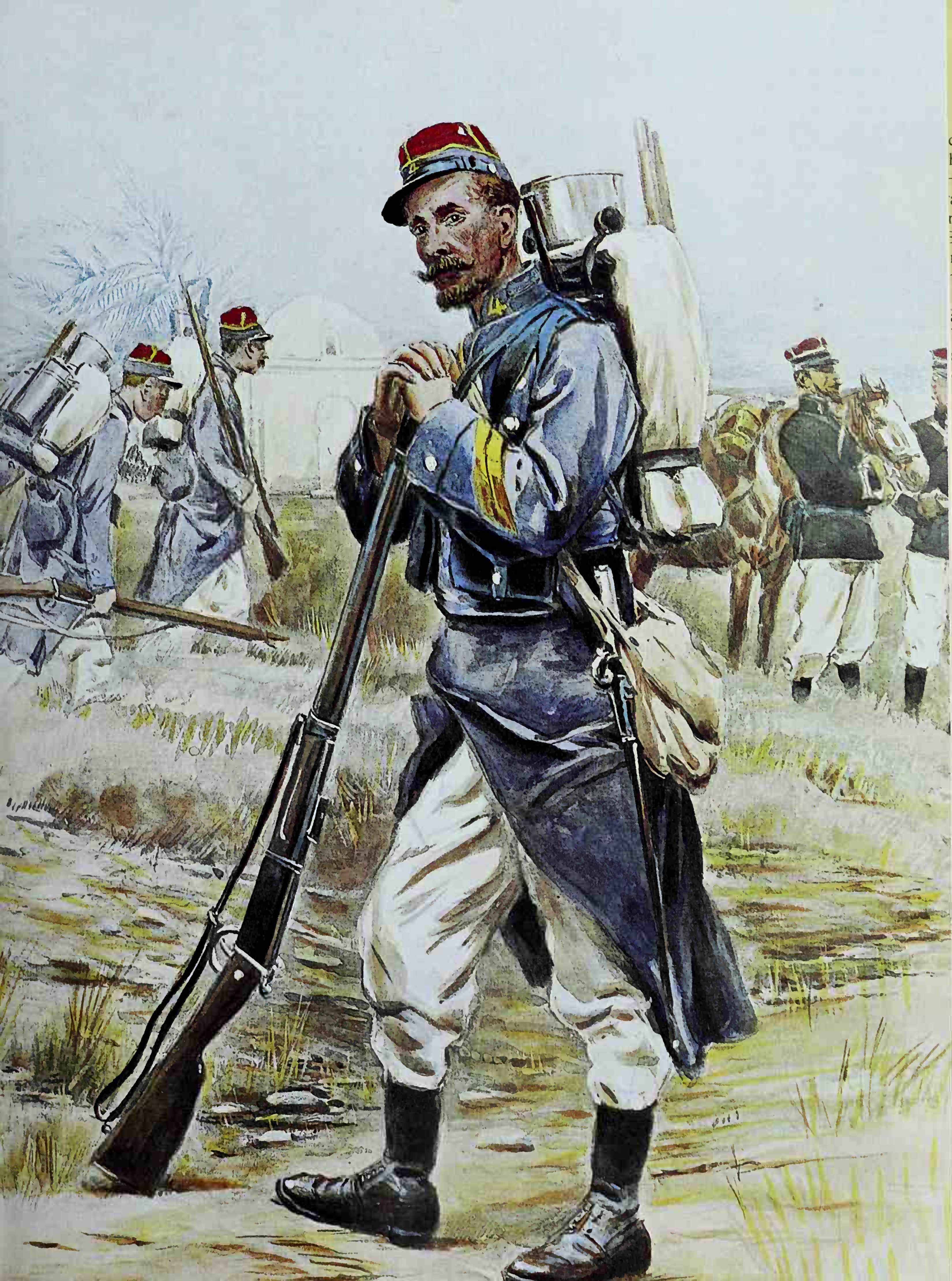


A curious legend surrounds James P Lee. In 1878–79, Lee lived in a room at the Osgood Hotel. He had a habit of bringing his drawings and models home at night, for further work. Remington also then employed a certain German mechanic by the name of Mauser. The story goes that Mauser bored a hole in the floor of his room—which was just above Lee's—and spend many hours flat on his stomach watching what went on below through the hole. The Mauser employed by the Remingtons was in fact the brother of Peter Paul and Wilhelm Mauser, the inventors of the Mauser Repeating Rifle: thus serious questions about the originality of the Mauser design persist. In any event, James P Lee is unquestionably credited with the invention of the box magazine and the Mauser Rifles were not so equipped until a number of years later.

The Spanish American War was a conflict that was short-lived, and thus had little effect on Remington and its partner, the Union Metallic Cartridge Company (UMC). The government did issue contracts, however, and Remington supplied rifles, while UMC made cartridges for the Army as well as brass cases for the six-inch shells with which Admiral Dewey's fleet won the battle of Manila Bay.

The summer of 1914 was one of unusual international tension. War clouds gathered upon the horizon of the world, but no one wanted to believe that war was possible. Archduke Francis Ferdinand, heir to the double Imperial Crown of Austria-Hungary, was shot by a Serbian at Sarejevo. Almost immediately Austria mobilized against Serbia. Russia mobilized against Austria in order to protect Serbia, in what Russia perceived as a religious war. Germany mobilized against France and France countered with its own defensive mobilization. The German armies surged forward and flowed over neutral Belgium. By the time the Germans were halted on the Marne, a short distance from Paris, the Allied governments had taken stock of their arsenals and found themselves in desperate need of guns and ammunition. Purchasing orders began inundating American firearms manufacturers in general, and Remington in particular. America was technically neutral, but its heart and hands were with the Allied cause. At first Remington produced a few thousand old fashioned Lebel rifles for France. Then the British ordered 1,000,000 Enfield

***At left:* Admiral Dewey on board the USS *Olympia*, at the Battle of Manila Bay—Remington made rifles, and the Union Metallic Cartridge Company made ammo for the US in the Spanish American War. *At right:* French troops of the 1880s, with Lebel rifles such as those Remington made for France some time later, in World War I.**



ci-
he
He
as
rs,
By
nt
ng

a-
le
es
e-
c-
rt
ne

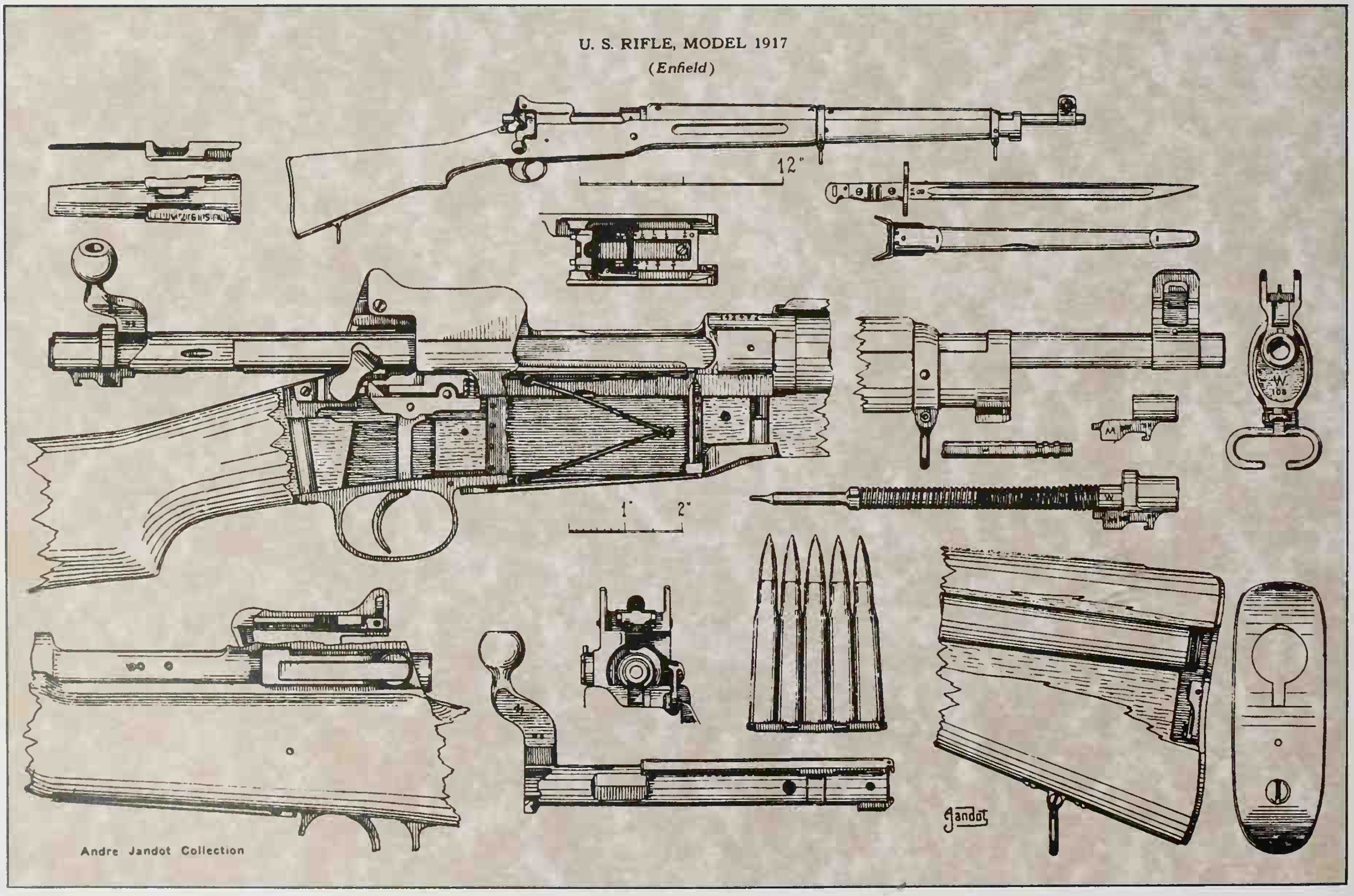
st
s-
s
s
y
g
y
-
s
l

rifles with the outlook that 1,000,000 more would be needed. Enfields had never been produced on a truly mass-production basis. It was up to the Remington engineers to retool their facilities to produce a maximum of 2000 guns per day. This meant that 3895 machines, 5905 fixtures, 7000 tools and 3415 gauges had to be revamped and/or fabricated, and mounted. Deliveries were to begin by 1 January 1916. This industrial miracle was actually accomplished a year ahead of schedule! Employment at the Ilion factory went from 1200 in 1914 to over 15,000 by 1917. Just before the United States entered the First World War, the factory turned out 61,000 Enfields for the British in one month!

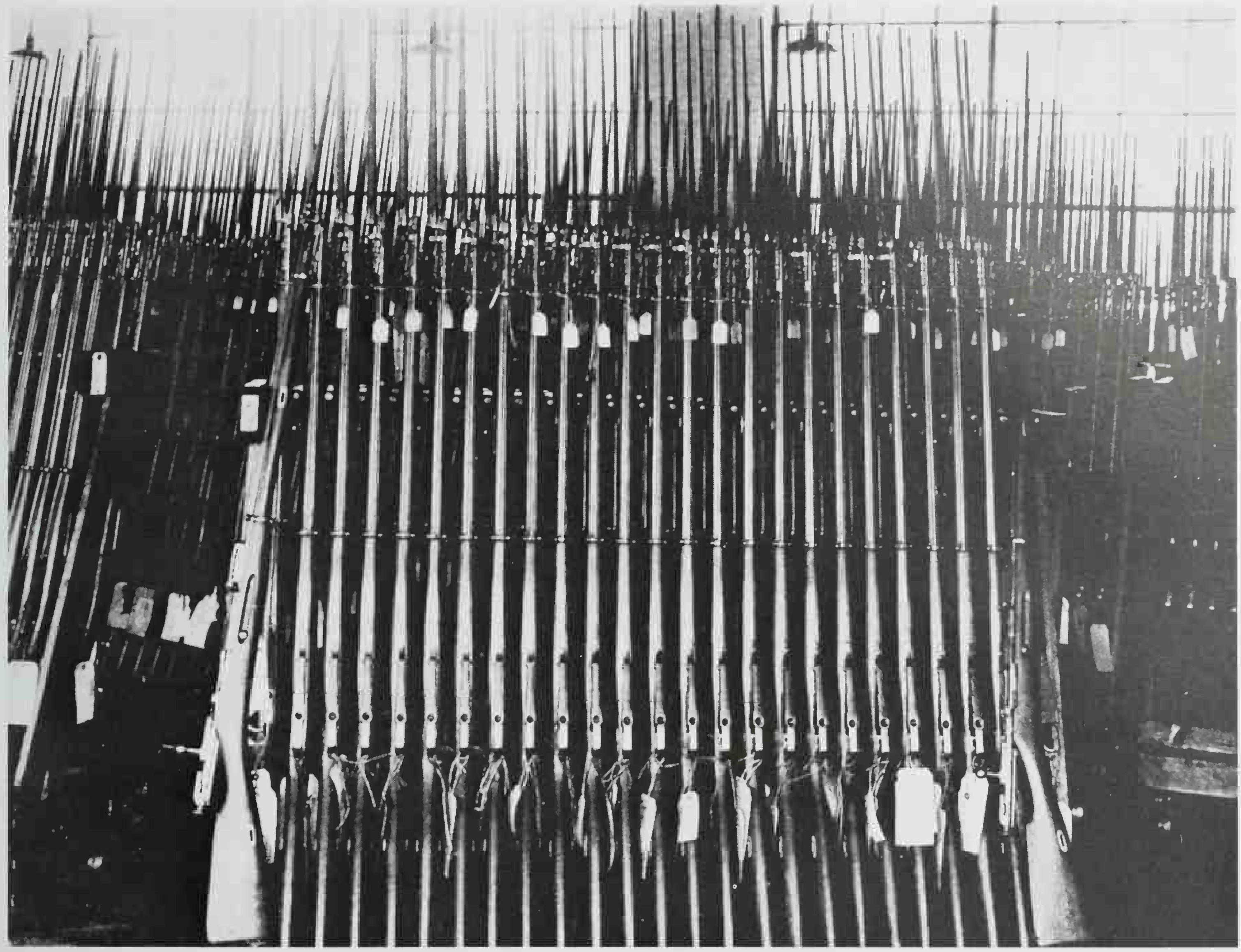
The Imperial Russian Government was the last of the great Allies to come to Remington for help. But when they did, it was in true Tzarist style. The contract which was signed in 1915 called for one million Russian rifles and 100 million rounds of ammunition. The British contracts were already overwhelming the Ilion and Bridgeport factories. Whole new factories would need to be built in order to accommodate the Russians. In order to insure that his investment was protected the Tzar sent no fewer than 1500 inspectors to the Remington factories to verify that the 5000 Russian rifles that were coming off the assembly line every day met critical standards. The most irritating of these inspectors was a Cossack captain who became known as 'Alexander the Great.' His particular worry was that the rifles might fire accidentally. He would take a gun off of the assembly line, load and cock it and then bang the butt on the concrete floor with all his might. Of course the rifles were too well made to accidentally discharge even when subjected to this kind of punishment, but as many as a dozen rifle stocks per day were cracked in this manner. Officials of the company could do nothing to stop this waste but the gunsmiths could. They filed down the locking mechanism on a particular rifle until the trigger literally hung by a hair of steel. They maneuvered this specimen into Alexander's hands. When the Cossack slammed the butt into the floor, the rifle naturally went off, and the projectile pierced a four inch pipe above Alexander's head sending a stream of water under high pressure into his upturned face, knocking him flat on his back!

By February 1917 the numerous Remington plants were producing at peak levels. Ilion was producing 2400 Enfields a day; the Bridgeport Rifle Factory, 5000 rifles and 5000 bayonets a day; and the Hoboken and Barnum Avenue plants, four million cartridges daily.

Then the unthinkable happened—all that had been Russia for almost 1000 years was overthrown! Tzar Nicholas II and his family were murdered. The Russian nation simply disintegrated into fragments, each fighting for its own survival. A provisional government under Alexander Kerensky was formed but lasted only a short time. Naturally, one of the first acts of the new Russian Republic was to repudiate all contracts that had been entered into by the Tzar's government. Remington had accepted the largest contract—and so was hardest hit. The Russian Revolution cost Remington millions of dollars in lost capital investment,


U. S. RIFLE, MODEL 1917
(Enfield)

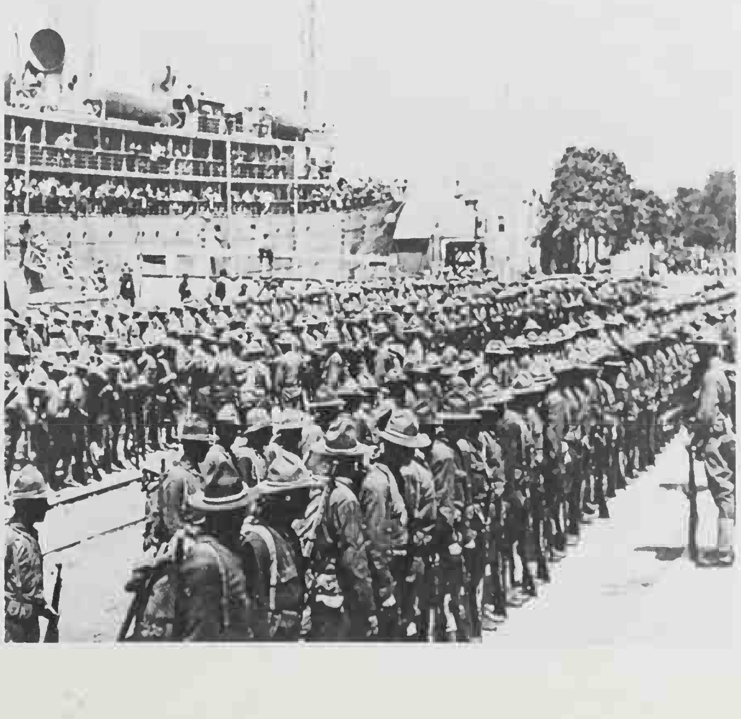
Andre Jandot Collection



stockpiled hundreds of thousands of unwanted rifles in warehouses, and threw thousands of American workers out of work suddenly. But on 2 April 1917, America entered the War pledging its 'lives, fortunes and sacred honor' to victory. If the war was to be won, America had to arm four million troops in a matter of months. This was partially accomplished by government contracts to purchase 600,000 of the 750,000 Russian rifles already manufactured by Remington; this reduced the company's loss from an estimated $10 million to about $300,000. (It is interesting to note that some of these rifles were later shipped by the US Government to Vladivostok—on the eastern coast of what is now the Soviet Union—to arm the White Russian Army which attempted to rescue that country from the Bolshevicks.)

The Army Ordnance Department estimated that at least four million rifles would be needed within two years—at a time when there were approximately 700,000 Springfields in government arsenals, and the total manufacturing capability was 350,000 rifles a year; this left a net deficit of three million guns. Remington engineers suggested a radical solution to this problem. They proposed redesigning the British Enfield to take the Springfield .30-06 cartridge. This new US Enfield would be a far simpler gun to make and could be turned out in huge quantities by both Ilion

During World War I, Remington combined the British Lee/Enfield bolt action design (which was relatively simple for Remington to manufacture) with the new, powerful, Springfield .30-06 cartridge. The result was the potent Model 1917 *(opposite)*. *Above:* Some of the rifles Remington built for the Tzar of Russia. *Below:* US troops in France, in 1917: many carried Remington-made arms.



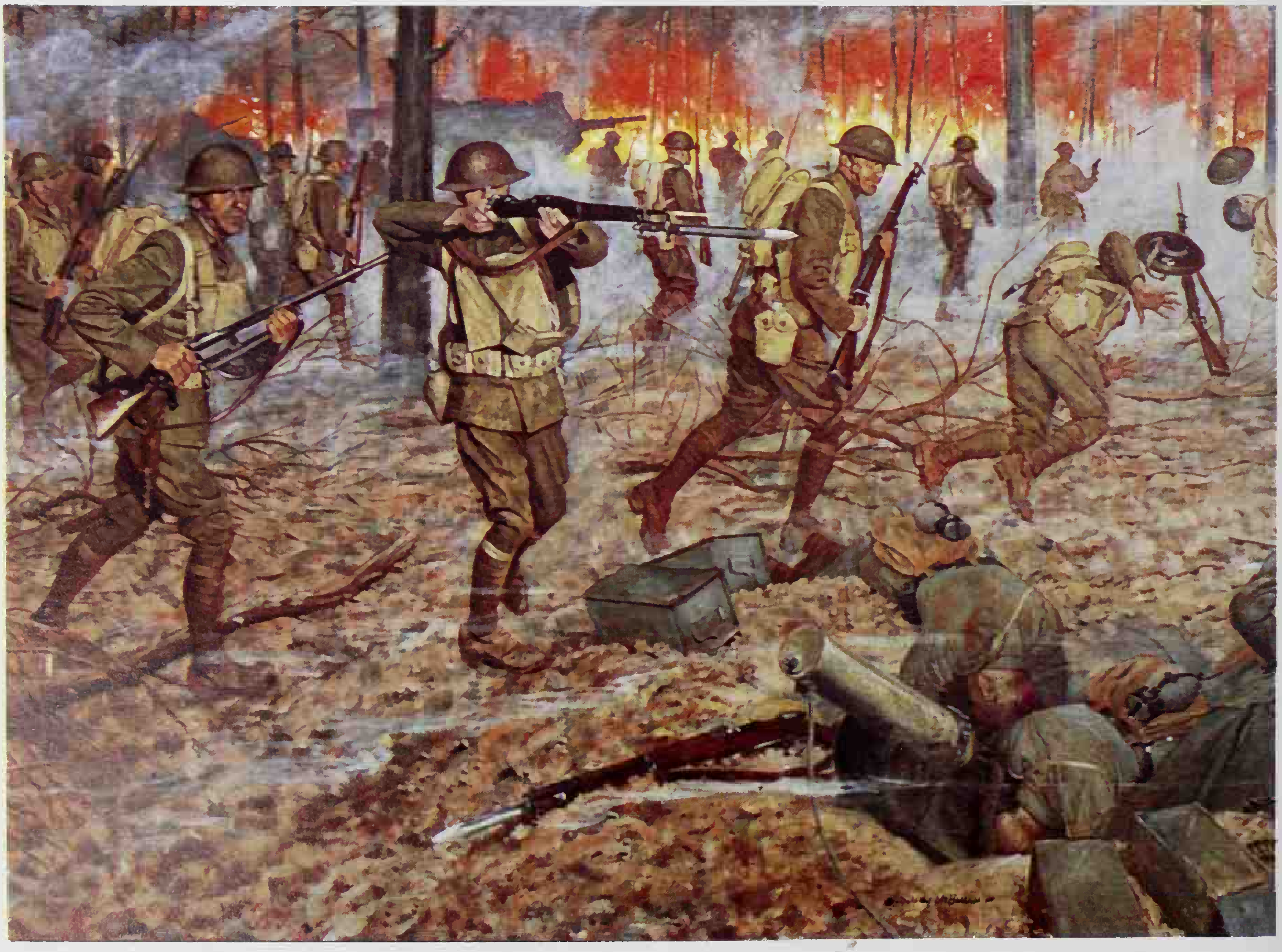
and other factories.

The new rifle was officially adopted by the Ordnance Department as US Rifle Model 1917. Remington retooled to make it, and other manufacturers also received large orders. By December 1917, production at Ilion was 3000 'M-17s' a day, and by June of that year production peaked at 4000 per day. Total production at Ilion was 545,541, while Remington's Eddystone plant produced 1,181,908 M-17s! By the war's end, over one million M-17s were stored in government arsenals. These were the same guns which would, 23 years later, be shipped to England after the British defeat at Dunkirk. These M-17s would play a pivotal role in saving Great Britain from a Nazi invasion.

Remington's production record for the World War I effort proved that a company whose foundation consisted of making sporting guns and ammunition could become one of the greatest industrial factors in the defense of the United States. Remington had produced 69 percent of all rifles manufactured for American troops during World War I and over 50 percent of all the small arms ammunition for the United States and her Allies. In addition, *all the ammunition* used by the Belgian Army in its four years of war was made by Remington.

In 1929, Remington sales amounted to over $21 million; by 1932, they had fallen below $8 million. At that figure, the company was losing money at the rate of nearly $1 million a year. Under these circumstances, merger or bankruptcy were the only alternatives left. Fortunately for Remington, El DuPont de Nemours & Company of Delaware would come to the rescue. Some personnel at DuPont were skeptical about entering a new field—that of firearms production—because DuPont had up until this time had as its primary direction chemical operations and production. In the spring of 1933, the DuPont directors voted, but not unanimously, to acquire a controlling interest in Remington common stock.

The outbreak of war in 1939 had virtually no effect upon Remington's profitability. The strict neutrality laws of the United States made it impossible for US arms manufacturers to produce weapons for any country's war effort. But neutrality laws finally gave way to lend-lease agreements, which enabled US manufacturers to meet the growing British demands. British Prime Minister Winston Churchill sent his personal representative, Sir Walter Leighton, to Washington to get rifles from the US at any cost. England was in desperate need of several million improved Enfields, but the new British Enfield rifles were difficult to produce and no one was equipped with the machinery to do the job. If Britain wanted rifles in less than the two-year time span needed to tool up for production, some kind of compromise would have to be found.



The US government at this time had the machinery for making Springfield rifles at the Rock Island arsenal. If the government would lease this machinery to Remington, production of *Springfields* for the British could begin within a year—But the British wanted *Enfields*, not Springfields, and objected; they proposed that Remington retool the Rock Island arsenal machinery to produce the Enfields they wanted.

Remington's president took a strong stand against this proposal. US Army troops were equipped with Springfields, and if the machines were altered they could not produce spare parts if required. As events proved, this was indeed a wise decision. Final agreement with the British was reached in January 1941, and nine months later Springfield rifles began coming off the assembly line three months ahead of schedule. This was indeed a remarkable feat of engineering: the model 1903 Springfield contained 91 parts, whereas the new model A-3 contained only 79; 23 parts, previously requiring forging, were redesigned so that they could be stamped by presses—and only 24 parts remained unchanged. The bulk of these remodeled Springfields were not delivered to the British as America was thrust into the conflict herself on 7 December 1941; it was impossible to supply all of our men with Garands—then the standard US service rifle—so our 'Yanks' also got A-3s; the US Government took over the British supply contract, and Remington was now arming American troops. Had it not been for Remington President CK Davis' stand against retooling for Enfields, the GIs would not have had those guns when they needed them the most.

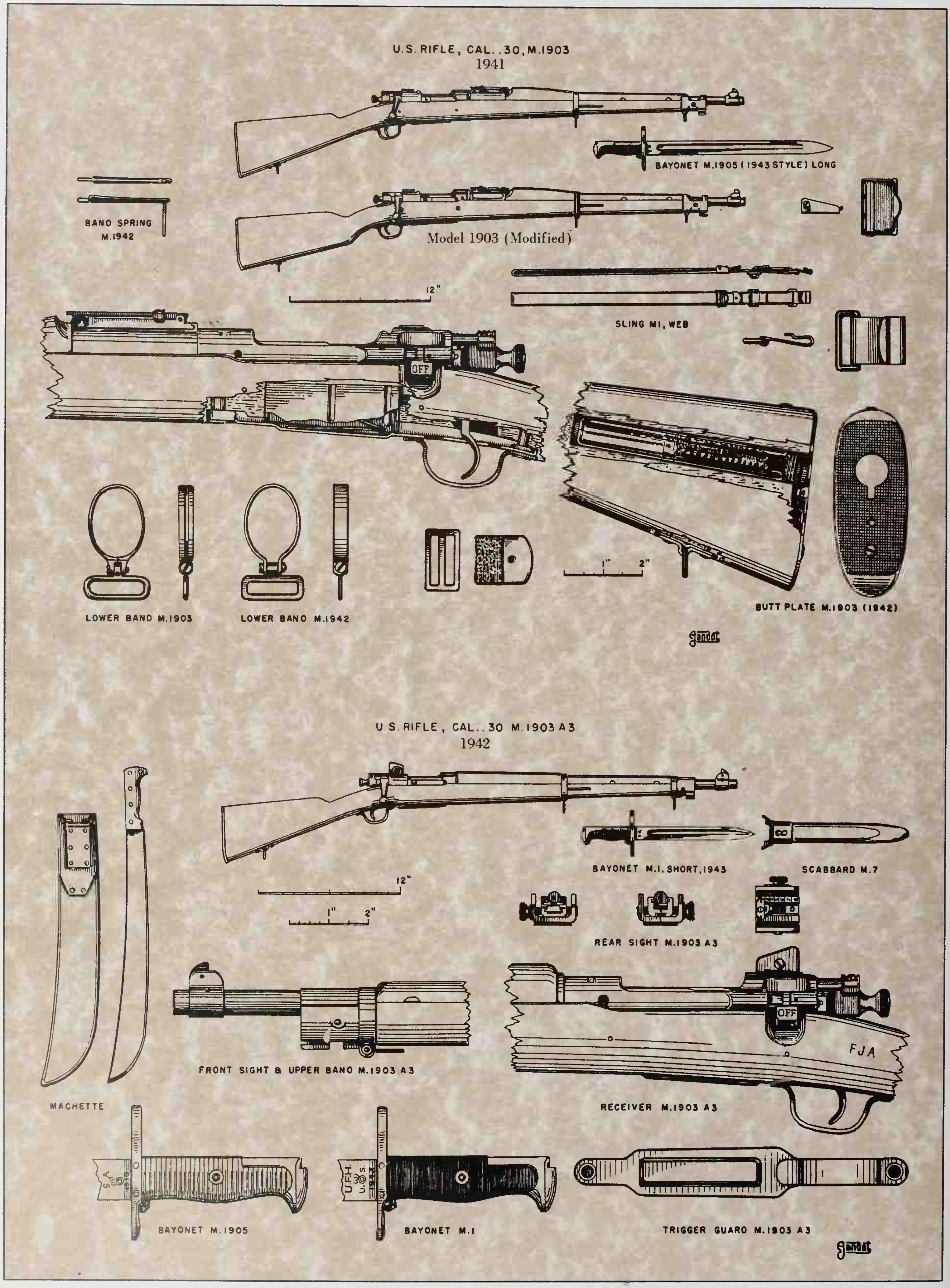
Remington's rifle production program was prodigious indeed, but did not compare with its production of ammunition. As early as June 1940, British contracts required the Remington Bridgeport facility to increase its production of .30 caliber ammunition by 600 percent and .50 caliber ammunition by 2000 percent! The capacity of the plant was increased with the understanding that at any time the capacity for further expansion would be used solely for the United States government, if needed. The British agreed to this provision and the job was begun. In the late summer of 1940, during the Battle of Britain, Remington was entrusted by the British government with a secret: bullets with an incendiary core. These were needed in .30 and .50 caliber. The incendiary bullet had to have exactly the same ballistic characteristics as both the ordinary lead core bullet, and the tracer bullet—otherwise they would be erratic in their flight. In less than a month, Remington had developed a working model of the bullet and had put it into large scale production. Later, the Army Ordnance Department would describe this accomplishment as, 'one of the vital factors in winning the Battle of Britain.'

Opposite: A painting of the World War I Battle of Soissons. In evidence here are Remington-made Model 1917s, fixed with bayonets, in the hands of American 'doughboys.' *Above:* US paratroopers in North Africa prepare for action during World War II: note the Model 1917 leaning against the truck.

In 1940, Remington had been approached by the Army Ordnance Department in Washington to prepare for war. At that time, in all of the Remington organization, there were only 360 men who had any experience with military ammunition. What the Ordnance people were asking for would require 40 times that workforce to be employed at Bridgeport alone. Remington management divided this almost impossible task into two divisions; the company-owned factories, and government plants which had just been constructed for the exigencies of wartime production. Even though DuPont was overloaded with work, they let Remington take some of their best men—which eventually amounted to over 500 supervisory personnel.

Remington's Lake City Factory was the first modern facility to be designed for the express purpose of making military ammunition. Eventually it would consist of seven distinct manufacturing units—three for .30 caliber, two for .50 caliber, and one for .30 caliber carbine cartridges. Each unit was in fact a complete factory in itself. Raw material went in one end, and finished cartridges came out the other. This was the first time in history that ammunition was made in what was referred to as a closed cycle, meaning a continuous process. This was both a dangerous and difficult way of manufacturing; if through carelessness or mechanical difficulties a number of defective cases were to get into the works, the whole process of production would have to be stopped until they were cleared out. In actuality, this only happened once: the workers' deep sense of their great responsibility made for this extraordinary record of quality control.

It is interesting to note that during the whole of World War II, there was only one serious explosion at a Remington Plant; this occurred at a small storage warehouse at Bridgeport. The Navy had placed a hurried call for ammunition and the regular packing department, already swamped with orders, was strained to fill it. Men were set to work hurriedly nailing up cases and someone, it is thought, drove a nail into a primer. The explosion cost seven people their lives, and


U.S. RIFLE, CAL..30, M.1903
1941
BAYONET M.1905 (1943 STYLE) LONG
BAND SPRING M.1942
Model 1903 (Modified)
12"
SLING M1, WEB
OFF
LOWER BAND M.1903
LOWER BAND M.1942
1"
2"
BUTT PLATE M.1903 (1942)
Gandot
U.S. RIFLE, CAL..30 M.1903 A3
1942
BAYONET M.1, SHORT, 1943
SCABBARD M.7
12"
1"
2"
REAR SIGHT M.1903 A3
FRONT SIGHT & UPPER BAND M.1903 A3
OFF
FJA
MACHETTE
RECEIVER M.1903 A3
BAYONET M.1905
BAYONET M.1
TRIGGER GUARD M.1903 A3
Gandot

from that time forward, Remington absolutely refused to compromise safety on government orders no matter how urgent the request.

At its peak, the huge Lake City plant comprised 3800 acres, 25 miles of road, 236 major buildings, 11 miles of railroad track and parking space for 5000 automobiles. The plant had its own hospital, police and fire departments. Originally, the plant was designed to have a daily capacity of two million rounds of .30 caliber cartridges and 640,000 rounds of .50 caliber cartidges. This was stepped up to meet Ordnance Department requirements until, at the end, capacity was over 8.9 million cartridges per day.

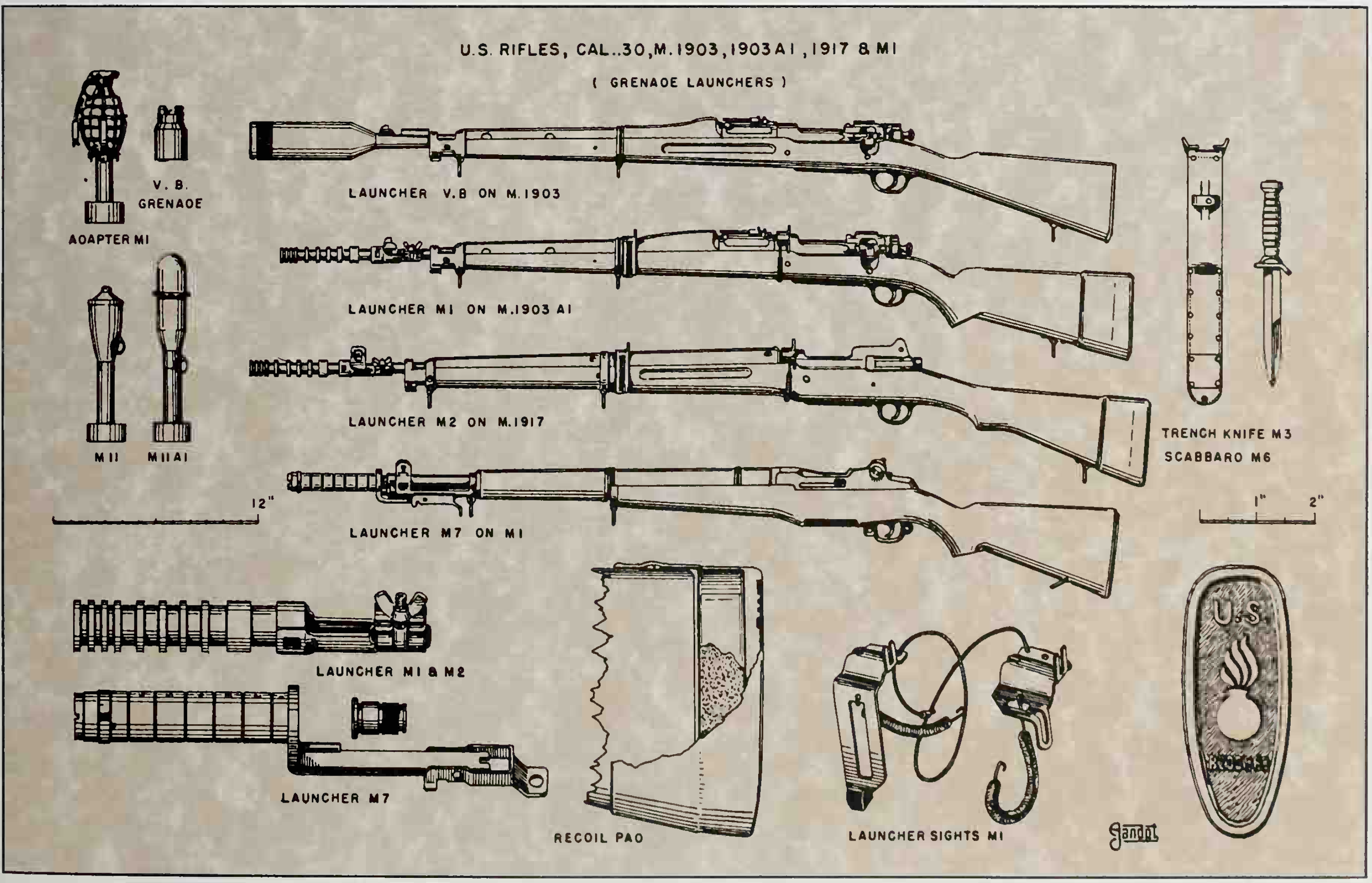
But sheer production figures are not the only story. In 1943, over 14,000 people worked at the Remington plant on Barnum Avenue. This plant was unique among ammunition plants for the sheer variety of calibers and types of ammunition that were manufactured at one location. The list included ball, armor piercing, tracer and incendiary bullets; standard military cartridges; a wide variety of primers; shot shells and .22 caliber cartridges for training; and several types of cartridge for special purposes. These included such oddities as .45 caliber revolver cartridges full of birdshot (good for killing snakes) for downed airmen who had parachuted into South Pacific jungles, and 'frangible bullets' for soldiers in training to practice firing live ammunition at an airplane without endangering the pilot.

Remington licensed the US government and all designated manufacturers *without charge* for all Remington patents and technology—Remington even made its Research and Development Department available to the government. This R and D Department worked on a wide range of projects for both the government as well as private manufacturers. Among Remington R and D accomplishments are the development of a grenade launcher for the Garand rifle, super high-speed artillery projectiles, electrically fired primers for machine guns, a 12 gauge shell to start torpedo gyroscopes, new ballistic instruments and dozens of other devices.

It is clear from a historical perspective, why the government selected Remington to be its chosen instrument in building new cartridge plants. The Ordnance Department had established rigidly high standards of acceptance for military cartridges. These standards had been set up in peace time under the assumption that ammunition thus produced was to be done on a small production basis. When these standards were brought into gigantic mass-production operations, questions naturally arose as to their feasibility—but Remington had faith in its people, and set up standards even tougher than those of Ordnance. As a result, Remington not only met the 'impossible' government specifications—but in some instances actually raised them even *higher*.

Another historically significant fact about the huge expansions; vast training programs; the setting of new standards; the development of new types of ammunitions; the complex organizing of machine tool procurement; *and* the arrangements for obtaining the

Remington at war. *Above left:* Design drawings for the Model 1903 Springfield rifle, redesigned by Remington in World War II as the 1903 A3 *(below left)*. *Below:* Design drawings of the M1903 Springfield and M1917 Enfield—and the M1 Garand, which Remington did not manufacture.



huge stockpiles of raw materials was *planned* and actually *set into motion before* Pearl Harbor. The men who were in the know realized that war was coming, and their far sighted wisdom made for a United States military that was far more prepared for war than is generally supposed. Therefore, when war did arrive, it was only a matter of stepping up an already prodigious capacity for the production of small arms and ammunition. The output of the government's cannily-built new plants was doubled almost overnight. This was due to the streamlining of assembly line designs. For example, production in the units designated to make one million .30 caliber cartridges was raised to two million and units designated for maximum daily production of 640,000 .50 caliber were stepped up to one million. This was possible not simply out of luck, but was the result of far-sighted preparations. Hardly had the great new ammunition plants gone into full production before the US Army found itself practically snowed under by cartridges: as early as July 1942, Ordnance began shifting emphasis away from .30 caliber ammunition, and by the summer of 1943, at the very height of the war, cutbacks in production were ordered.

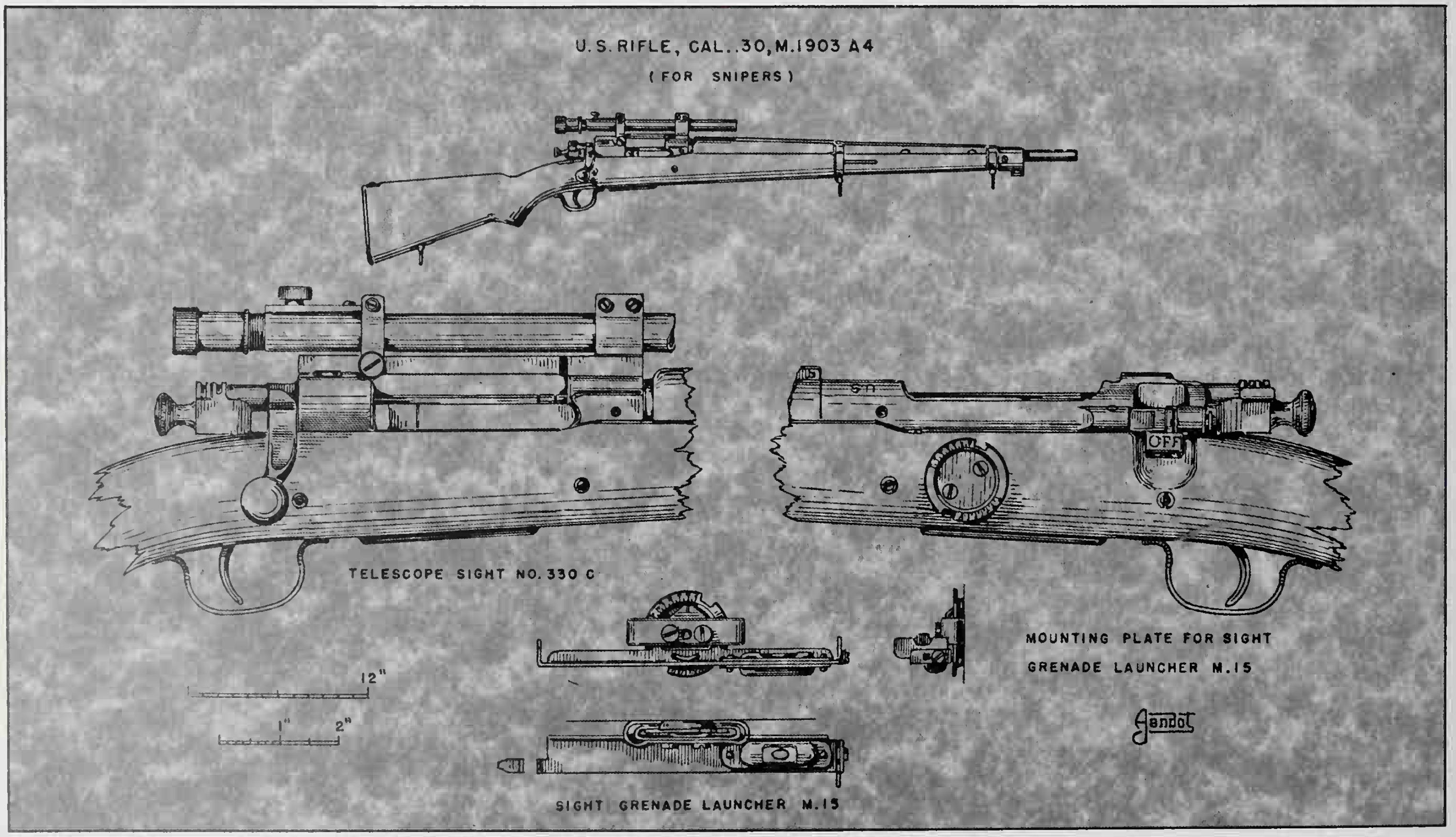
On 31 December 1943, five full months *before* D Day, the huge Salt Lake City, Utah, plant was ordered to cease operations and was placed in standby condition. Operations at the Denver plant ended on 31 July 1944, and the plant was converted to make fuses for artillery projectiles. All the requirements of the Ordnance Department had been met in 'overflowing' fashion. The government was justifiably lavish in its recognition of Remington's outstanding services during this critical period of American history. On 24 August 1942, the Army/Navy E—for 'Excellent'—pennant was awarded to the Lake City plant. Both the Denver and Bridgeport Works were similarly awarded one month later. The Ilion plant received its award on 9 November 1942 and the Utah plant was honored in September of the following year. Remington's smallest plant at Findlay was given the right to hoist the Pennant of Excellence on 31 August 1944.

Many American corporations expanded fully 100 percent, and some grew up to 500 percent, to meet defense requirements during the war years. Few, if any, expanded over 2000 percent as did Remington: in 1939, there were fewer than 4000 people employed in all Remington plants; at the peak of production in 1943 Remington personnel numbered 82,500! (During this time over 15,000 Remington employees joined various branches of the Armed Services, and replacements were trained for them.)

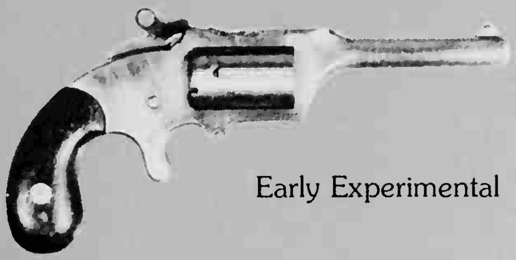
Remington's safety record is nearly as astounding as its production records. In 1939 the major injury rate was 1.07 per million man hours worked. By 1942, the rate was only 0.88 and in 1943 it dropped to 0.67. Even though Remington plants were producing dangerous commodities, their safety record ranked far better than the average for general industry. Both the Lake City, Kansas and Denver, Colorado Ordnance plants achieved safety records which are among the best all-time performances in the history of industrial safety.

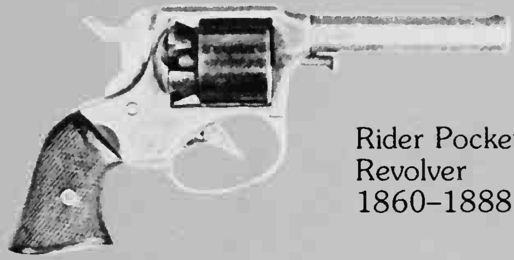
During the World War II years, Remington manufactured no fewer than 1,840,000 rifles and more than 16 *billion* cartridges for the US government. The ammunition statistic represents *41 percent* of all the small-arms ammunition used by the United States during that war for its own forces and for Lend-Lease.

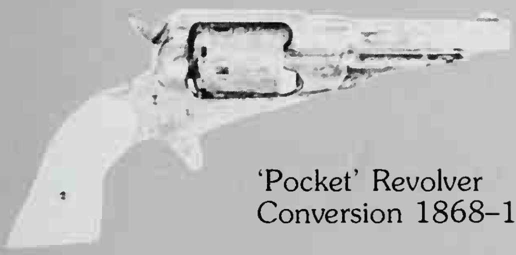
***Below:* A sniper version of the Model 1903. *At right:* Remington handguns.**

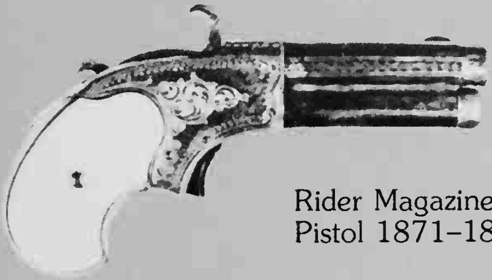

U.S. RIFLE, CAL..30,M.1903 A4
(FOR SNIPERS)
OFF
TELESCOPE SIGHT NO. 330 C
12"
1"
2"
MOUNTING PLATE FOR SIGHT
GRENADE LAUNCHER M.15
Gandot
SIGHT GRENADE LAUNCHER M.15

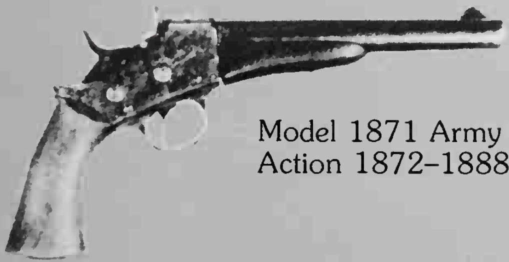
Remington Pistols to 1938

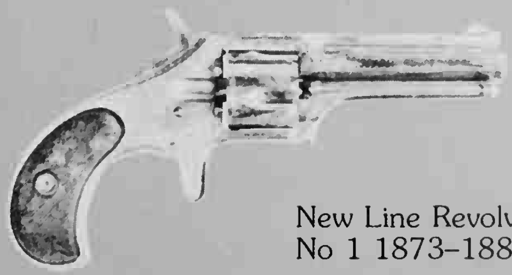

Early Experimental

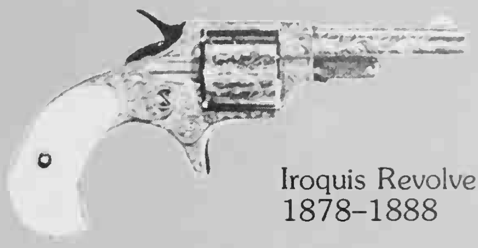

Rider Pocket
Revolver
1860–1888

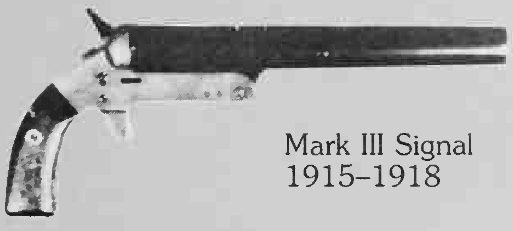

'Pocket' Revolver
Conversion 1868–1888

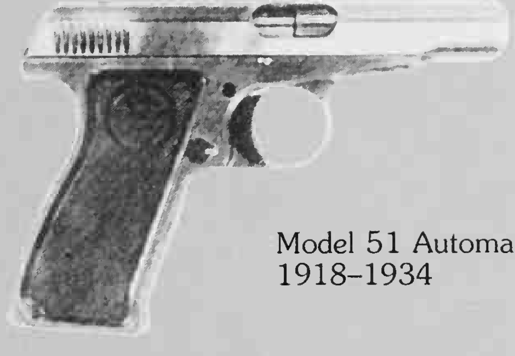

Rider Magazine
Pistol 1871–1888

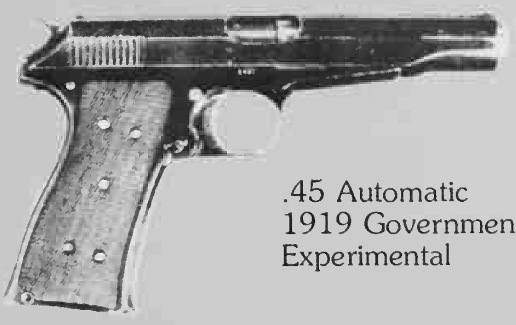

Model 1871 Army Single
Action 1872–1888

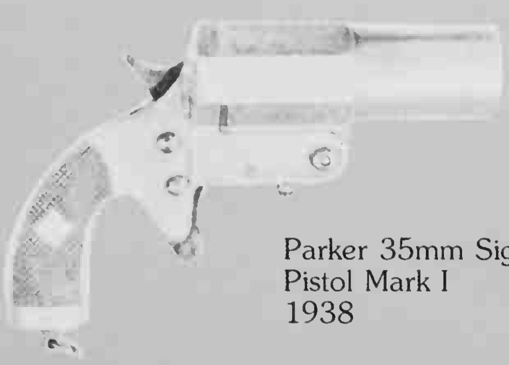

New Line Revolver
No 1 1873–1888


Iroquis Revolver
1878–1888


Mark III Signal
1915–1918


Model 51 Automatic
1918–1934


.45 Automatic
1919 Government
Experimental


Parker 35mm Signal
Pistol Mark I
1938

MIGRATORY BIRD HUNTING AND CONSERVATION STAMP
$7.50
OCT.
PT.
HUNTING TAG
CITIZEN RESIDENT
28802
DISPLAY ON MIDDLE OF
THE ORIGINAL ROBERT B. THOMAS FARMER'S ALMANAC,
Weather Fo
For 16 regions of the
176 pages including
PLANTING TABLES, ZODIAC SEC

Many an American GI has dreamed, while on duty across the seas, of returning home to such a familiar setting as this. *These pages:* 'Remington—as American as apple pie.' So implies this homey photograph, taken very early on a chilly autumn morning, of a prime example of the improved Model 870 Wingmaster—one of the world's great pump action shotguns, and a carrier of the Remington tradition of unmatched craftsmanship.

Anniversary (1792-1980) Edition
No. CLXXXVIII
$1.00
WEATHER FOR 1980
YOUR FAMILY TREE
THE OLD
ARMER'S
1980
ANAC
HOMAS
ALSO FEATURING ASTRONOMICAL TABLES, TIDES, HOLIDAYS, ECLIPSES, ETC.

Remington

The history of ammunition actually began in the 13th century, when Roger Bacon experimented with new ways of making what was then called 'Greek fire' by combining saltpeter, sulfur, and charcoal—and eventually blew himself out of this world in the process. Gun powder was thus invented—and not for another 600 years would the formula change appreciably. The first real advance in ammunition technology ocurred when a French gunsmith named Houiller came up with the idea of *encapsulating* projectile and powder, and thus made the first cartridges.

These early cartridges were made of various kinds of paper, cardboard or linen, and were easily broken or ruined by water. In the US Civil War, for example, wastage from such causes consumed 40 percent of the ammunition in the field. Some of these early cartridges had to be bitten open before loading so that the loose powder could spill out to be ignited by the percussion cap. Good teeth were thus a military necessity: for many years, the United States Army ran fresh recruits through severe dental tests to determine whether their teeth met evenly! (These standards were still in place until the middle of World War II when the Pentagon finally decided that no one needed to bite modern cartridges.)

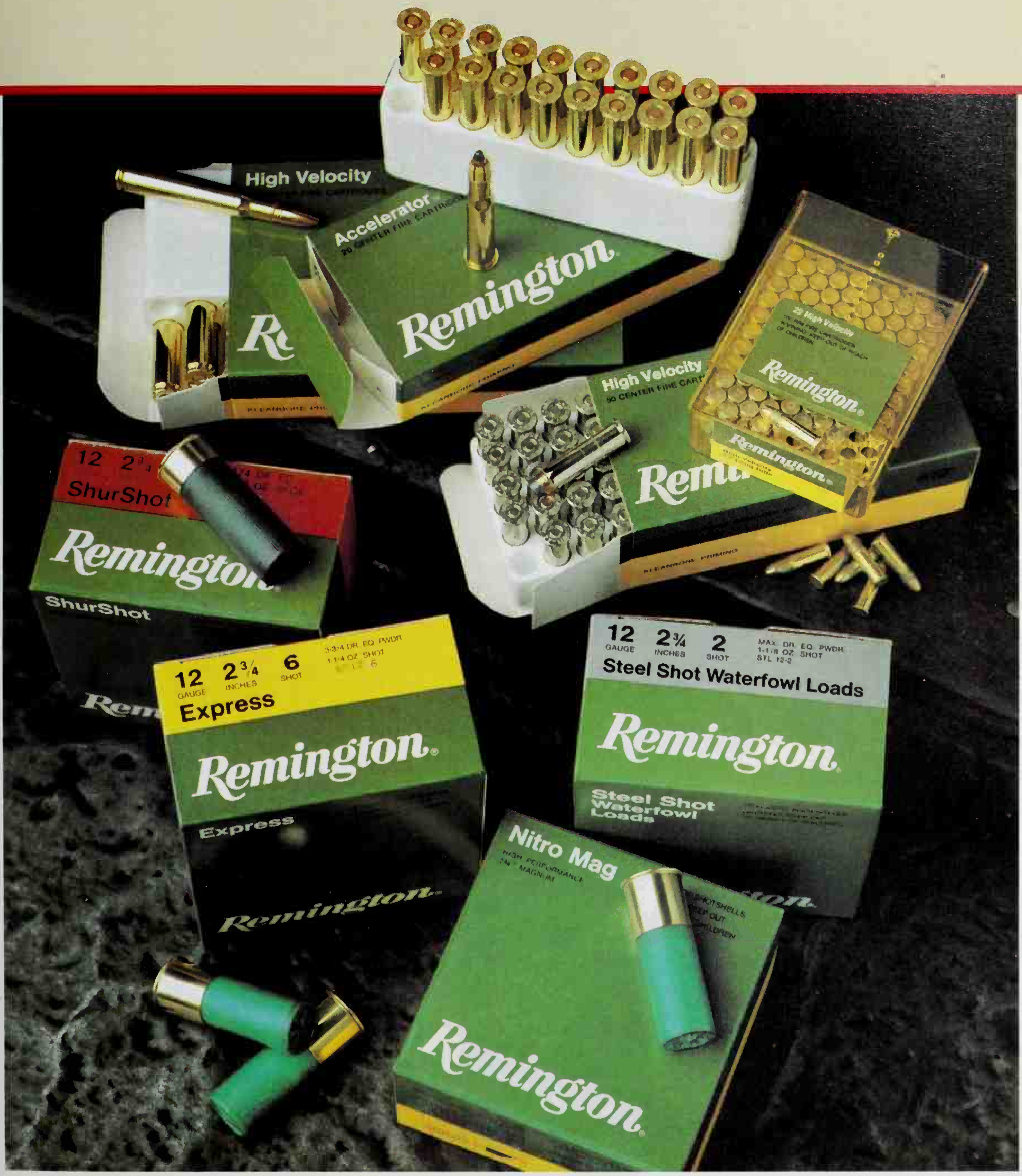
In 1807, a Scottish clergyman named John Forsythe invented the percussion cap, which was simply a pinch of highly volatile fulminate of mercury sandwiched between two small copper disks which were shaped to fit securely over a 'nipple' in the breach of a firearm. When this 'cap' was struck by the hammer, the miniature explosion sent flame through the nipple into the powder charge in the gun's breech. The first half of the 19th century saw these ideas—the cartridge and the percussion cap—evolve into an idea about combining the percussion cap with the cartridge in one unit! German gunsmiths produced the 'needle gun' which was also the first bolt-action rifle: this weapon had, in place of the now-familiar firing pin, a long needle which penetrated the fulminate of mercury-charged base of a thin-walled cartridge, detonating its powder charge. The cartridges, however, were often unreliable and tended to stick in the chamber.

The first cartridge that was truly successful was made by the Maynard Rifle Company in 1851. It consisted of an elongated bullet set into a brass case containing the powder. The percussion cap was a separate affair mounted in the base of the shell. At this same time, Smith and Wesson produced an equally 'developmental' metallic revolver cartridge. The Volcanic Arms Company improvised on these ideas by making a hollow rim around the base of the cartridge and filling it with fulminate of mercury: this was the first practical rim fire cartridge.

With the invention of the metallic cartridge, the supremacy of breech loading guns was fully established. The fact that the brass cartridge would expand from the pressure of the explosion and thus automatically seal in all escaping gases and flames made these kinds of guns truly practical. The US Civil War was fought mainly with percussion cap firearms, but the conflict proved that these were obsolete. Any soldier, whether Blue or Grey, who had seen a Sharps or a Henry or a Remington Geiger wanted such a metallic

***At right:* A sampler of Remington ammo types, for all levels of sport. Remington has long been a major contributor to the advance of cartridge ammunition, and offers a full line of rifle, pistol and shotgun ammunition.**

Ammunition


High Velocity
Accelerator
20 CENTER FIRE CARTRIDGES
Remington
High Velocity
50 CENTER FIRE CARTRIDGES
KLEANBORE PRIMING
12 2¾
ShurShot
Remington
ShurShot
12 GAUGE 2¾ INCHES 6 SHOT
3-3/4 DR. EQ. PWDR
1-1/4 OZ. SHOT
Express
Remington
Express
12 GAUGE 2¾ INCHES 2 SHOT
MAX. DR. EQ. PWDR
1-1/8 OZ. SHOT
STL 12-2
Steel Shot Waterfowl Loads
Remington
Steel Shot Waterfowl Loads
Nitro Mag
HIGH PERFORMANCE
2¾" MAGNUM
Remington

cartridge-firing breech loader.

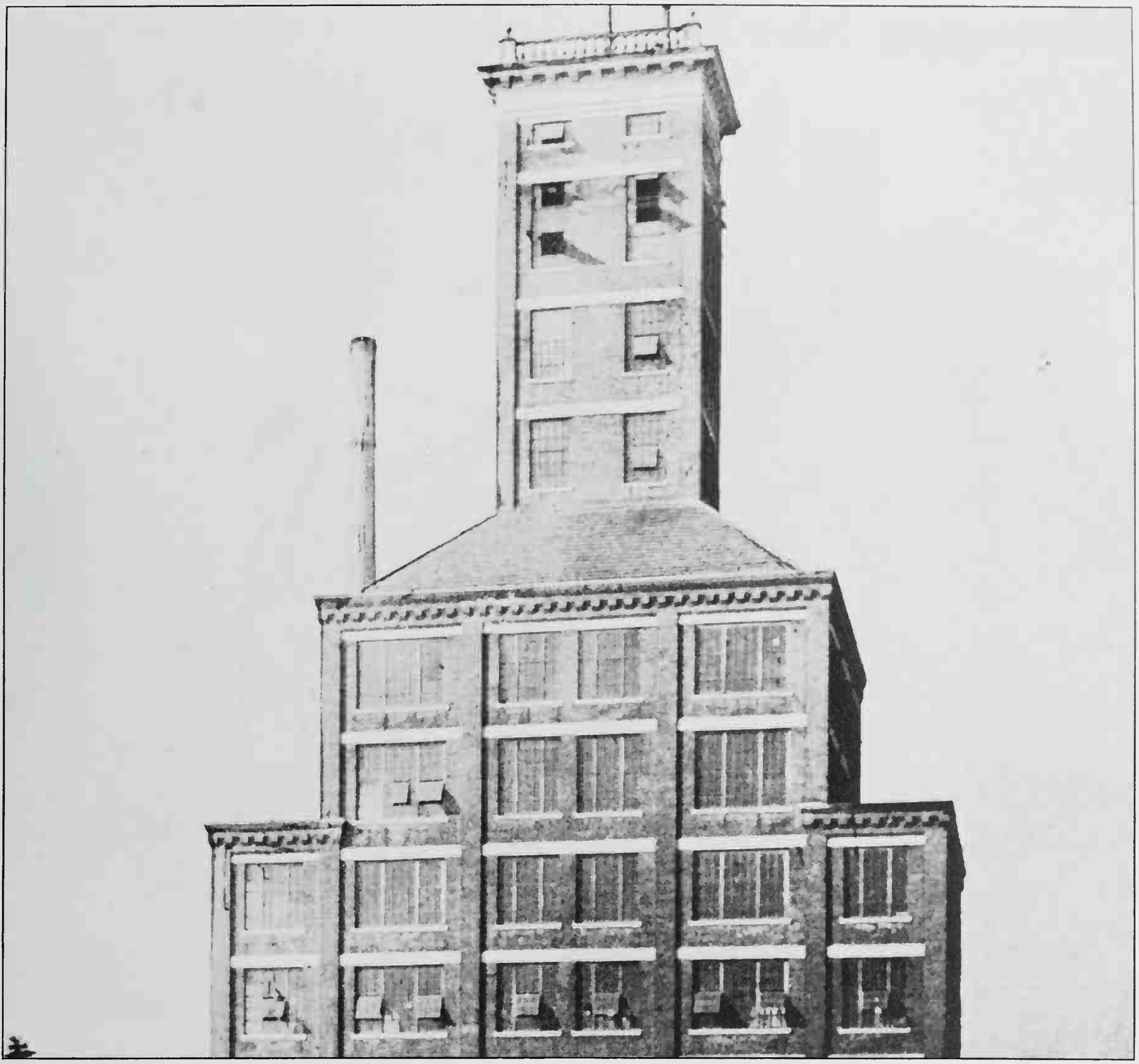
Marcellus Hartley—perhaps the most brilliant of the arms entrepreneurs of the time—recognized that the trend toward metallic cartridges was fat with the possibility of enormous profits. Gunmakers usually had plenty to do in times of war, but in peace time, sport shooter and hunter would only buy two or perhaps three guns in his lifetime. However, Hartley reasoned that sportsmen would need to buy ammunition every year; thus the ammunition trade with its almost continual cash flow would prove to be a stabilizing influence in the otherwise 'boom and bust' firearms trade. Hartley and his partners bought two small New England cartridge companies—the Crittenden and Tribbals Manufacturing Company of South Coventry, Connecticut, and the CD Leet Company of Springfield, Massachusetts. Crittenden and Tribbals made the ammunition for the Spencer Rifle which Schulyer, Hartley and Graham sold. Hartley later moved the entire business to the Tribbals factory at South Coventry. Then he moved the whole operation to Bridgeport, Connecticut, and on 9 August 1867, incorporated and consolidated it all into the Union Metallic Cartridge Company.

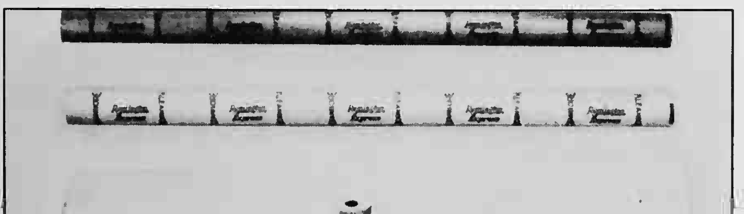
The mechanical wizard AC Hobbs came to work for UMC and was soon put in sole charge of the manufacturing end of the business—a position which he held for over 20 years. During that time, Hobbs personally invented complete machinery complexes to move cartridges production beyond handwork and into all-machine operation. This automation not only vastly increased the speed at which ammunition could be produced and insured quality control but, more importantly, increased the safety factor of the operation as a whole.

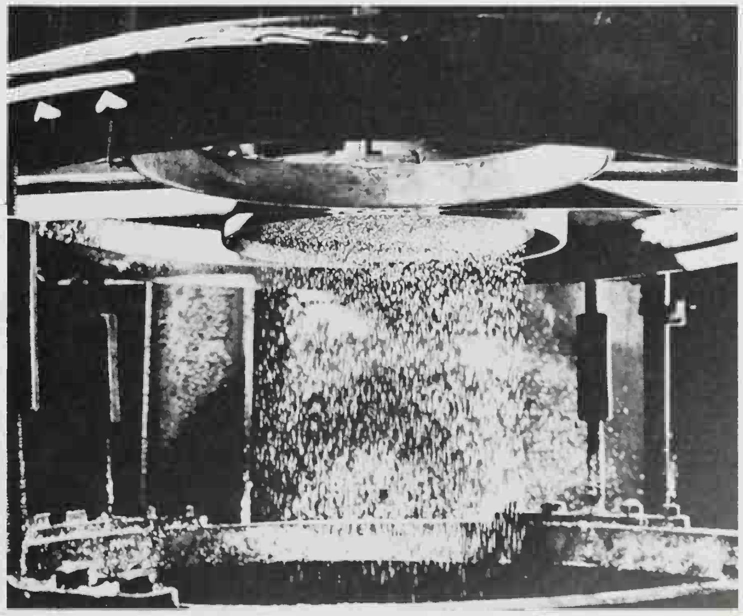
One day a rather strange Armenian gentleman known only as Mr Azerian came calling at the UMC headquarters. After being taken on a courtesy tour of the Bridgeport operation, Mr Azerian identified himself as a representative of the Turkish Government and on the spot ordered 10 million rounds of ammunition. This was a staggering order for such a young company—and in time, some of the contract was signed out to the newly organized Winchester Arms Company. This one Turkish contract not only put UMC on its financial feet, but the surplus also assured the success of Winchester Arms.

About this time Colonel Hiram Berdan invented a new bullet configuration: it was accurate up to 300 yards. The Colonel also invented a breech loading mechanism known as the 'Berdan Slam Bang Breech.' This mechanism was used by the United States Army after the Civil War to convert muzzle-loading Springfields into breech loaders, and was also incorporated into the standard rifle of the Imperial Russian Army. Colonel Berdan's clever bullet was an ingenious modification of the then still-new rim fire cartridge. However, Berdan's cartridge had a percussion cap, or 'primer,' embedded in the center of the case surrounded by a flange of reinforcing brass: this 'primer' is known world-wide as the 'Berdan primer.' This was the first practical center fire cartridge and it was first manufactured by UMC at Bridgeport. The advantage of a center fire cartridge over rim fire ammunition was its enormously greater strength—due to the fact that you could make the casing thicker, since the firing pin had no need to dent the center fire case as it did the rimfire case. Much more powder and therefore more power and bullet velocity could now be packed into a metallic cartridge; the center fire was also more sure of firing and less apt to accidental discharge. The increased safety of the center fire cartridge is illustrated in the official report of the tests at the Frankfort Arsenal on 21 April 1868: 'A wooden box

METALLIC CARTRIDGE COMPANY
T 19 MAIDEN LANE NEW YORK.





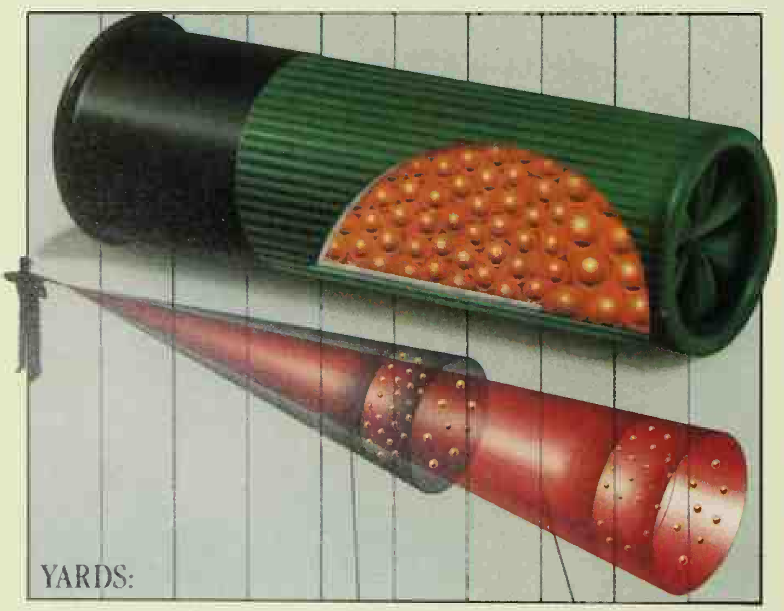


At left: **The Union Metallic Cartridge Company, early on. *At top:* A 'shot tower,' in which molten metal falls from its pan *(at right)* into the shot-hardening tank. *Above:* Remington shotgun shell components.**

Shotgun Shells

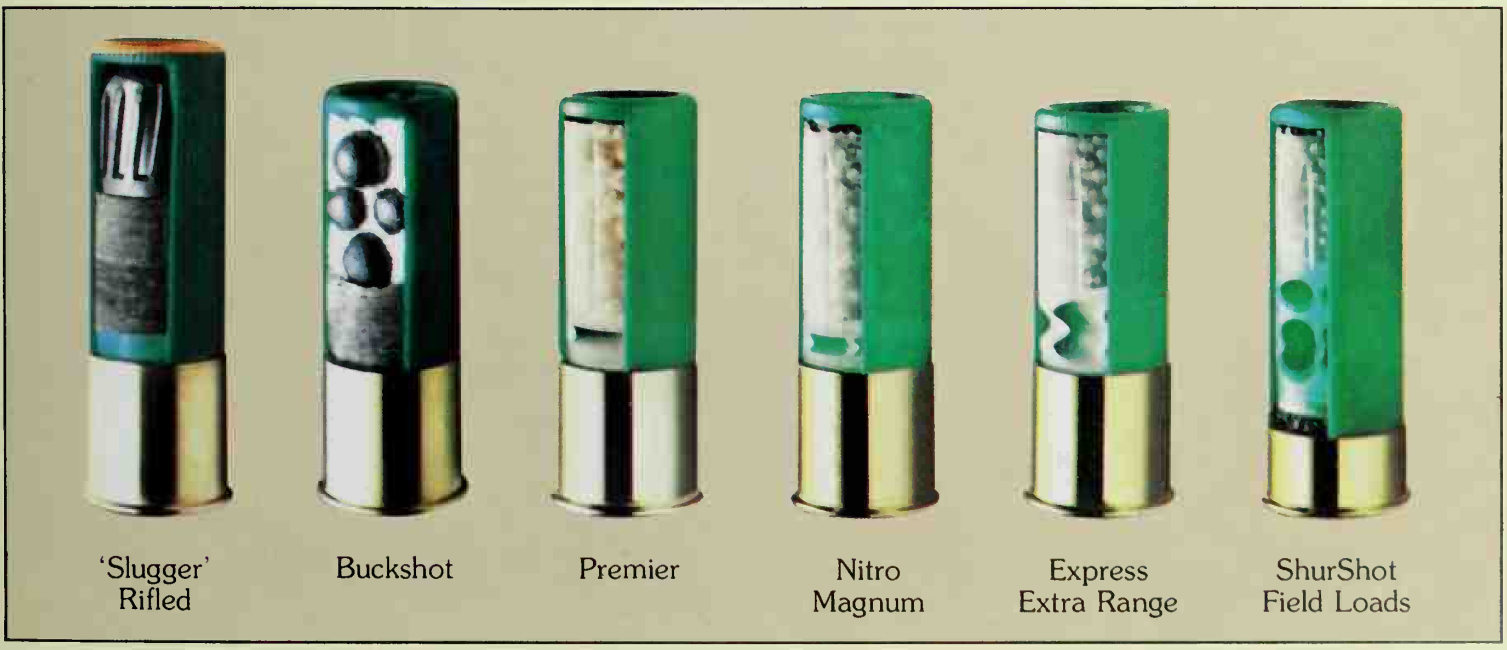
Immediately above: Remington's revolutionary Express Extra Range 'Duplex' shotgun shells feature two sizes of shot (*above right*, somewhat magnified) in the same cartridge—see 'Shotguns' in the Civilian Arms chapter, this text.

Below: An illustration of the performance of same. *Below right:* Remington's new nickel-coated buckshot on display, with cartridge and package of 10. *Opposite page, clockwise from bottom:* A selection of Remington shotgun shells; insertable chokes and wrench for the Rem Choke (see 'Shotguns') system; ghost view of a Remington Premier Target shot shell; sophisticated figure-eight wad from same; and Remington's advanced Premier 209 primers. Remington can coordinate the designs of its ammo and its arms, and thus fulfill any shooter's needs.



PREMIER MAGNUM
buckshot
Remington

REMINGTON
FULL
STEEL 4


'Slugger' Rifled

Buckshot

Premier

Nitro Magnum

Express Extra Range

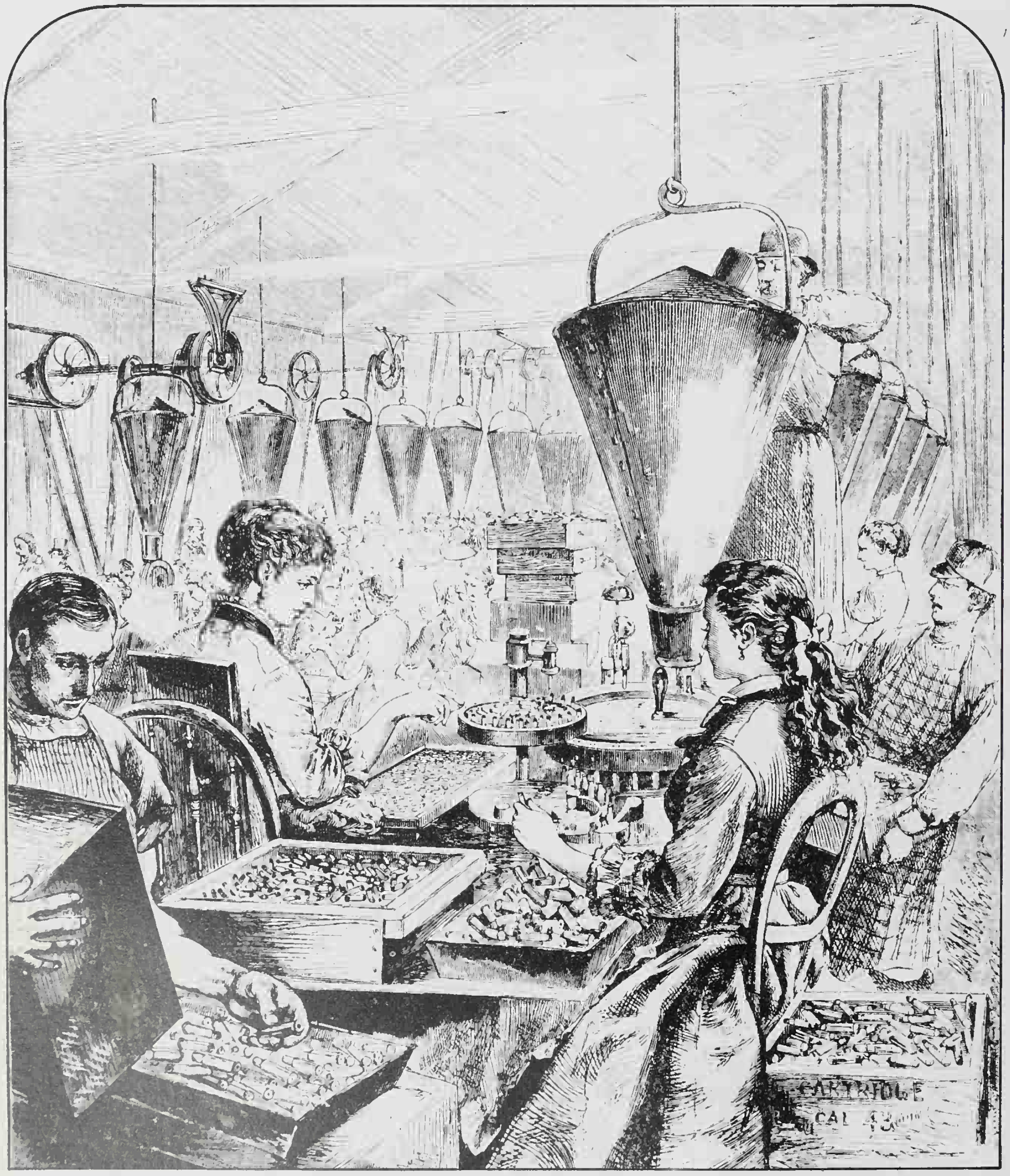
ShurShot Field Loads

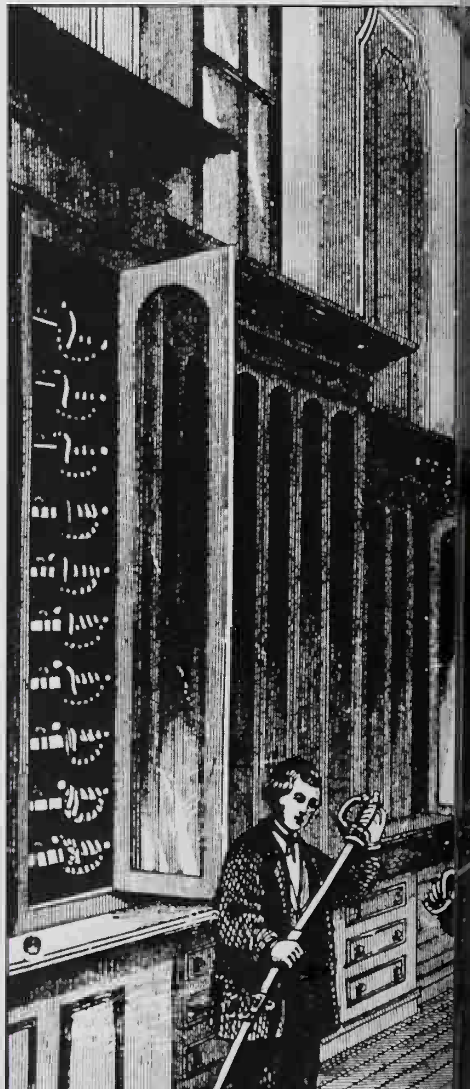
ready for issue containing 680 metallic cartridges, caliber .50, in paper packages was fired into from the one-inch Gatling Gun. Three shots perforated the box and the upper layer of paper packages, destroying the upper half of the wooden box. The damage done was as follows: 29 cartridges exploded, 97 badly crushed out of shape, but not exploded, 38 loose uninjured, 480 in paper packages uninjured. The trial seemed to prove that the explosion of a caisson or an ammunition dump is robbed of its greatest terrors by being confined to only a small number of the few cartridges that may be struck by an enemy's shot.'

Due to Hobbs' inventive genius and to the terrific pace at which he worked, UMC got into large scale production only a few months after the contract with Berdan was consummated. These events would place UMC almost overnight in a commanding position in small-arms ammunition manufacturing. Unlike many inventions, the Berdan cartridge was an instantaneous success. The gunmakers of America as well as the rest of the world immediately began to adapt their locks to use the center fire principal. This was especially true of the Remingtons, who had just produced the famous Remington Rolling Block Rifle. The combination of the new Remington breech loader and the UMC ammunition was simply unbeatable.

Hartley and his partners became the general sales agents for Remington, thus establishing the close cooperation between the companies which eventually resulted in their merger. The market for center fire ammunition was explosive. The Union Metallic Cartridge Company had one of the fastest growth rates ever recorded in American history. In 1867 it had only about 30 employees and one small factory; only four years later buildings had sprouted up all over the Bridgeport site and production was over 400,000 cartridges per day.

However, fast production and overwhelming quantities did not mean a sacrifice in quality. UMC ammunition was tested to very high standards, and these standards the company took pains to maintain on a rigidly consistent basis. For example, the bark *Forya*, bound from New York to the Russian fortress of Kronstadt with a cargo of 3,645,120 cartridges, was destroyed in a gale. Her deck was stove in, and the crew abandoned the water-logged hulk. Some days



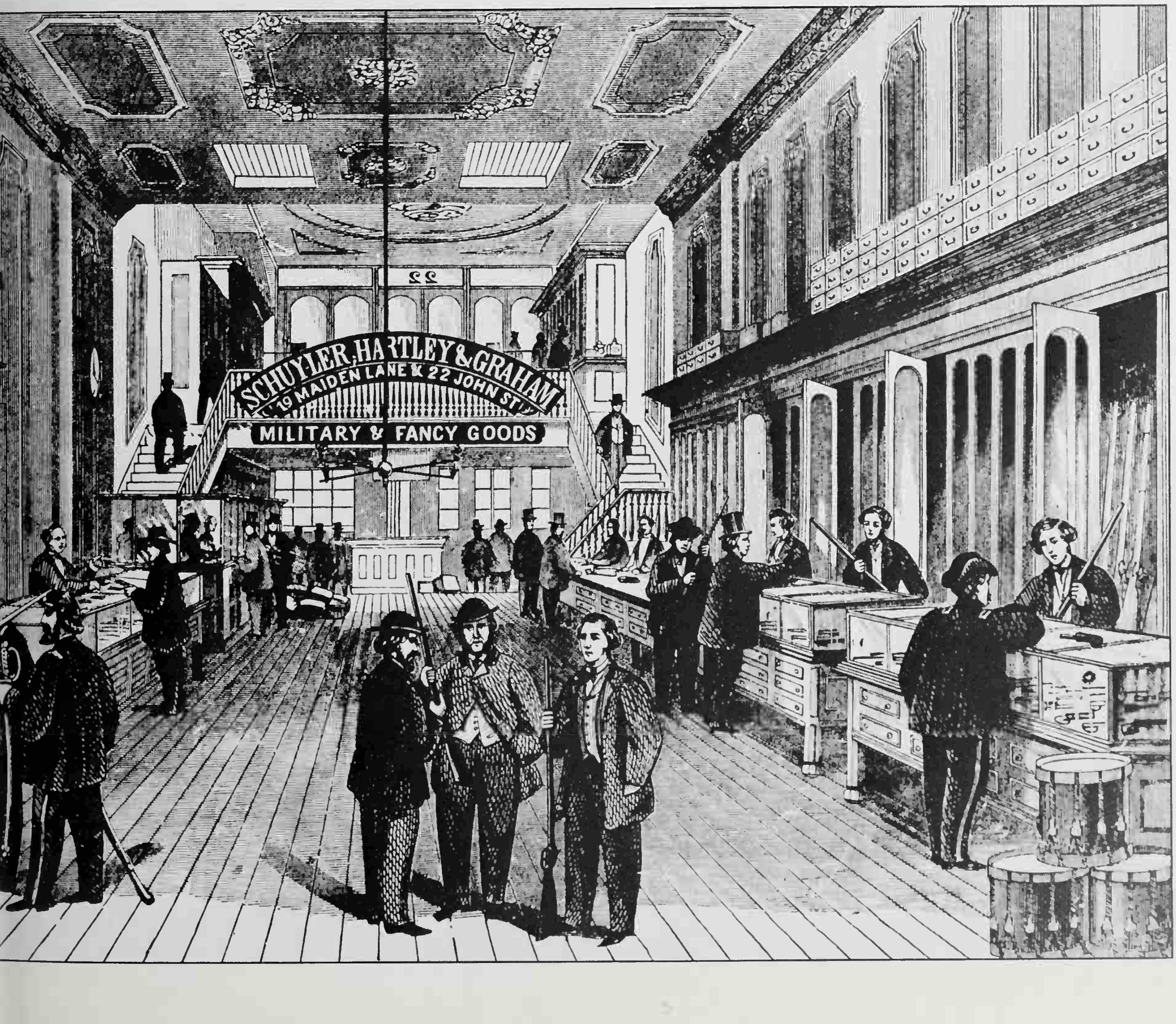


later, the SS *Iowa* found the derelict barely afloat in a North Atlantic steamer lane. With salvage as their incentive, the officers and crew of the *Iowa* pumped out the *Forya* and towed her back to New York. The ammunition which had been under water for five weeks was taken out and shipped to Bridgeport. Tests were conducted and the report states, 'The wet paper boxes were removed and 10,450 of the cartridges were fired, proving them uninjured.' Twenty years later, more of this same lot were tested without a misfire. Another rigorous accidental test of UMC ammunition occurred in 1898; when the US battleship *Maine* was blown up in Havana Harbor, the UMC small arms ammunition aboard her went to the bottom. In 1911, her twisted hull was brought to the surface by Naval engineers and hundreds of these cartridges—which had lain at the bottom of a tropical sea for 13 years—were shot off without a single misfire.

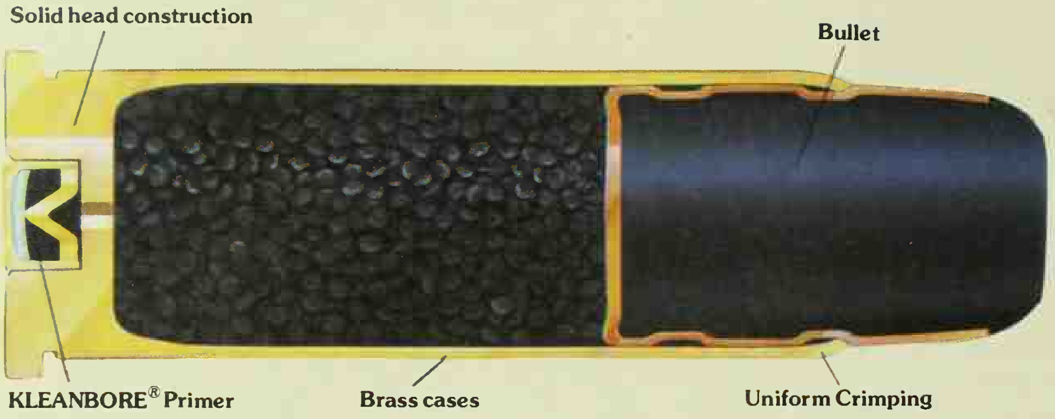
Since UMC was not bound to any special type of arm, like the gunmaking companies were, it was free to make cartridges for everyone. The catalogue for 1872 listed over 30 separate patterns, including center fire, rimfire, cap and ball, and, generally, cartridges applicable to breech loaders of all descriptions—even the Gatling gun! By the early 1900s, the company was able to produce more than 15,000 different loads, varying from BB caps to 10 gauge shot shells. This tremendous variety was due to Hartley's determination that there should be a UMC cartridge for *every* type of gun that was made. This was not simple vanity for the benefit of advertising, but was the cornerstone of his business philosophy. That philosophy proved valid indeed.

With center fire cartridges squarely in the mainstream of the ammunition market, inventiveness lagged until the early 1920s. The fact that gun bores were subject to corrosive build-ups of residue after firing proved the need for general improvements in ammunition. Unless rifles were cleaned almost instantly after a day's shooting, or even after firing only a single shot, the shining bore would be coated with corrosion, and its polished perfection could possibly be ruined forever.

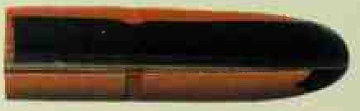
Below: **The interior of Marcellus Hartley and partners' firearms and munitions store. Hartley and cohorts formed the Union Metallic Cartridge Company. *Opposite:* Inside the UMC Bridgeport ammunition factory in the 1870s.**



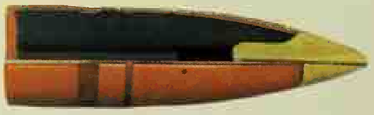
Cartridges


Solid head construction
Bullet
KLEANBORE® Primer
Brass cases
Uniform Crimping

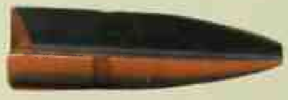
Inside a modern Remington center fire cartridge *(above)*. *At left:* The tip of a Remington Soft Point bullet, a semi-jacketed projectile which features improved mushrooming upon impact for better knockdown power. *At right, from the top down:* A well-mushroomed Soft Point; cutaway views of various Remington bullet types. *Below:* The shiny brass and copper look of modern Remington center fire rifle cartridges. *Opposite, from left to right:* A selection of Remington rimfire ammo—.22 caliber blunt point antisnake bullets; standard .22 long rifle bullets; and .22 caliber hollow point bullets. Note that the first and the last of these are 'hyper velocity' rounds.



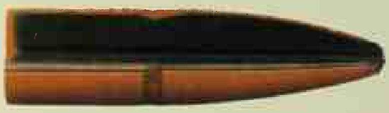
Core-Lokt® Soft Point



Bronze Point™ Expanding



Power-Lokt® Hollow Point



Core-Lokt Pointed
Soft Point

VIPER 22
Remington
500 Hyper Velocity Solid Bullet Rimfire Cartridges
1922
22 High Velocity
Remington
High Velocity 22 Long Rifle
RIM FIRE CARTRIDGES
YELLOW JACKET
Remington
50 Hyper Velocity 22 Rim Fire Cartridges
EXTRA POWER CARTRIDGES

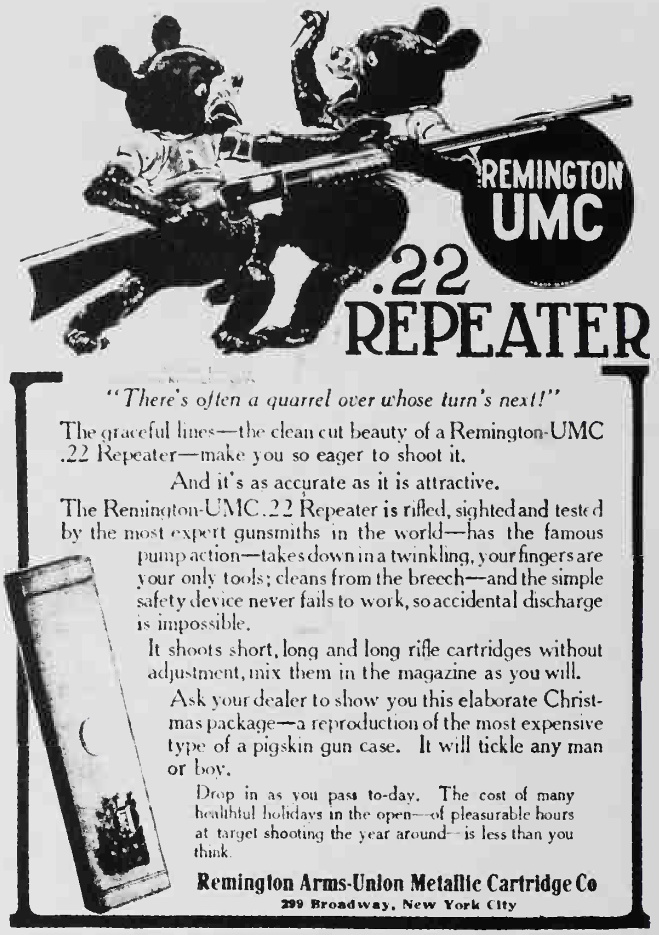
0
30
330
300
E
S
N
FINLAND

This damage was not caused by the erosion of the bullets or the smokeless powder, but by the chemical action of the fulminate of mercury and potassium chlorate used in the primers. Potassium chlorate was the real villain: it is akin to plain table salt, and absorbs water so quickly that even a minute grain would instantly begin a rusting process and eat a tiny hole in the steel.

In 1926 Remington introduced 'Kleanbore' ammunition which freed gunners from the incessant use of cleaning rags and powder solvents.

James E Burns, an imaginative chemist, paid a visit to Remington in the winter of 1924. He spoke of his plans for a trip to Florida, and then pulled out a revolver and began shooting—luckily with only primed empty cartridge cases. He requested that Remington technicians lay the pistol away in a damp place until he returned from his trip in about a month. When he returned, the revolver was examined: the bluing on the outside of the barrel showed streaks of rust—but when a dry rag was run through the barrel, the bore shown with pristine brilliance. Here was a chemical miracle! Burns had discovered a substituted for potassium chlorate in primers.

It took over two years of intensive experimentation before Remington was ready to go on the market with this new noncorrosive primer. The formula finally used contained lead styphnate, which was manufactured by DuPont. Extensive testing was carried out both in


REMINGTON
UMC

.22 REPEATER

"There's often a quarrel over whose turn's next!"

The graceful lines—the clean cut beauty of a Remington-UMC .22 Repeater—make you so eager to shoot it.

And it's as accurate as it is attractive.

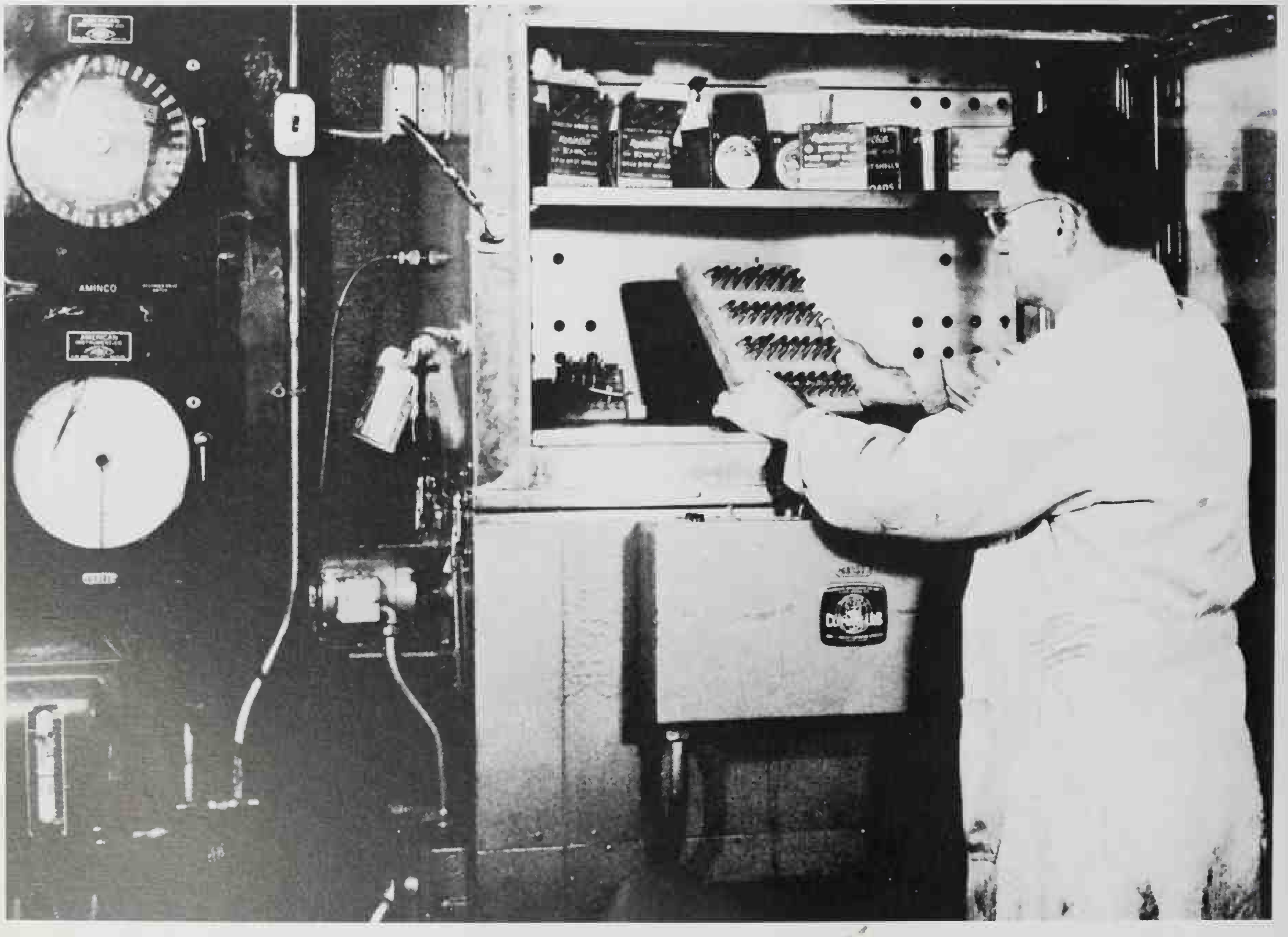
The Remington-UMC .22 Repeater is rifled, sighted and tested by the most expert gunsmiths in the world—has the famous pump action—takes down in a twinkling, your fingers are your only tools; cleans from the breech—and the simple safety device never fails to work, so accidental discharge is impossible.

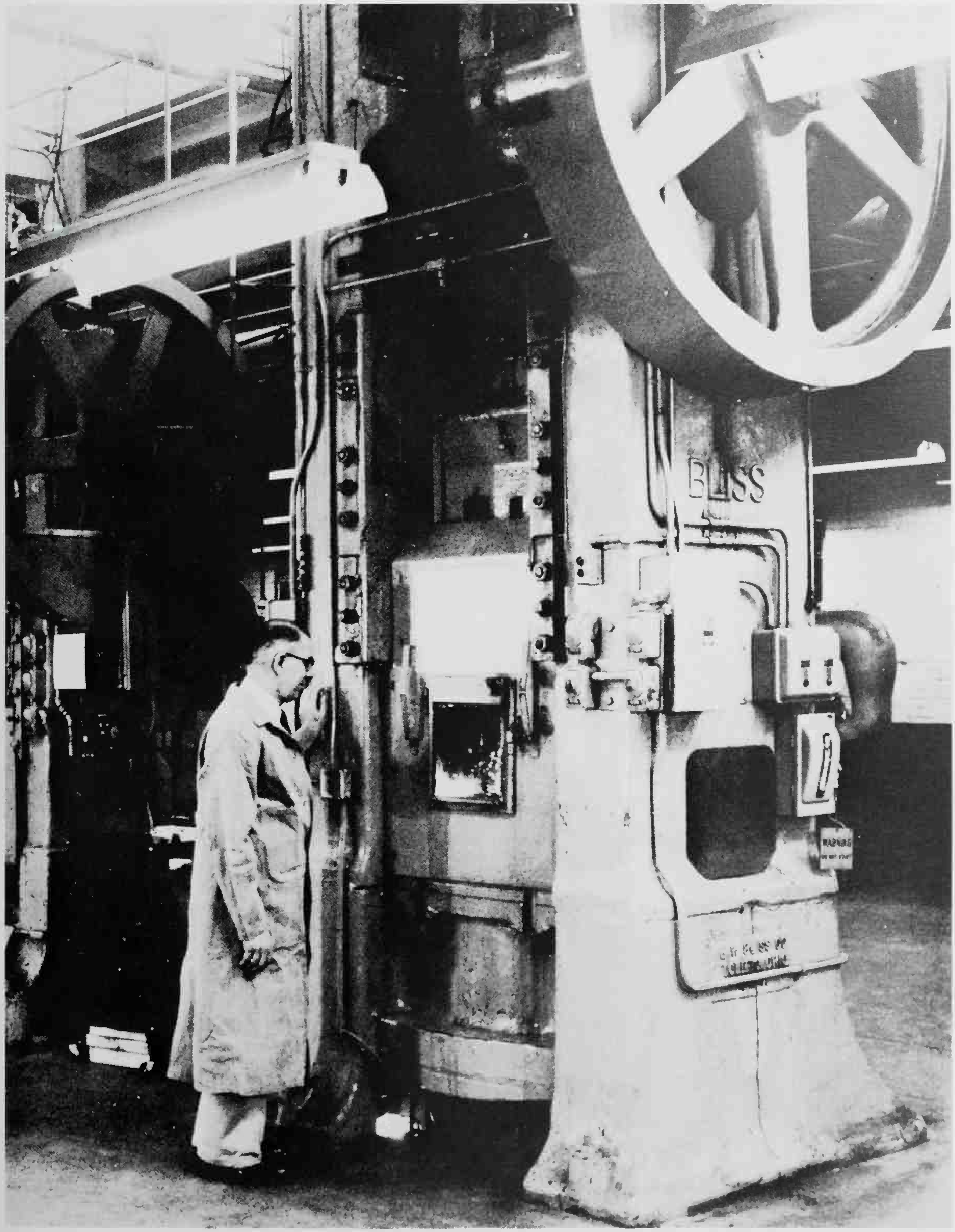
It shoots short, long and long rifle cartridges without adjustment, mix them in the magazine as you will.

Ask your dealer to show you this elaborate Christmas package—a reproduction of the most expensive type of a pigskin gun case. It will tickle any man or boy.

Drop in as you pass to-day. The cost of many healthful holidays in the open—of pleasurable hours at target shooting the year around—is less than you think.

Remington Arms-Union Metallic Cartridge Co
299 Broadway, New York City





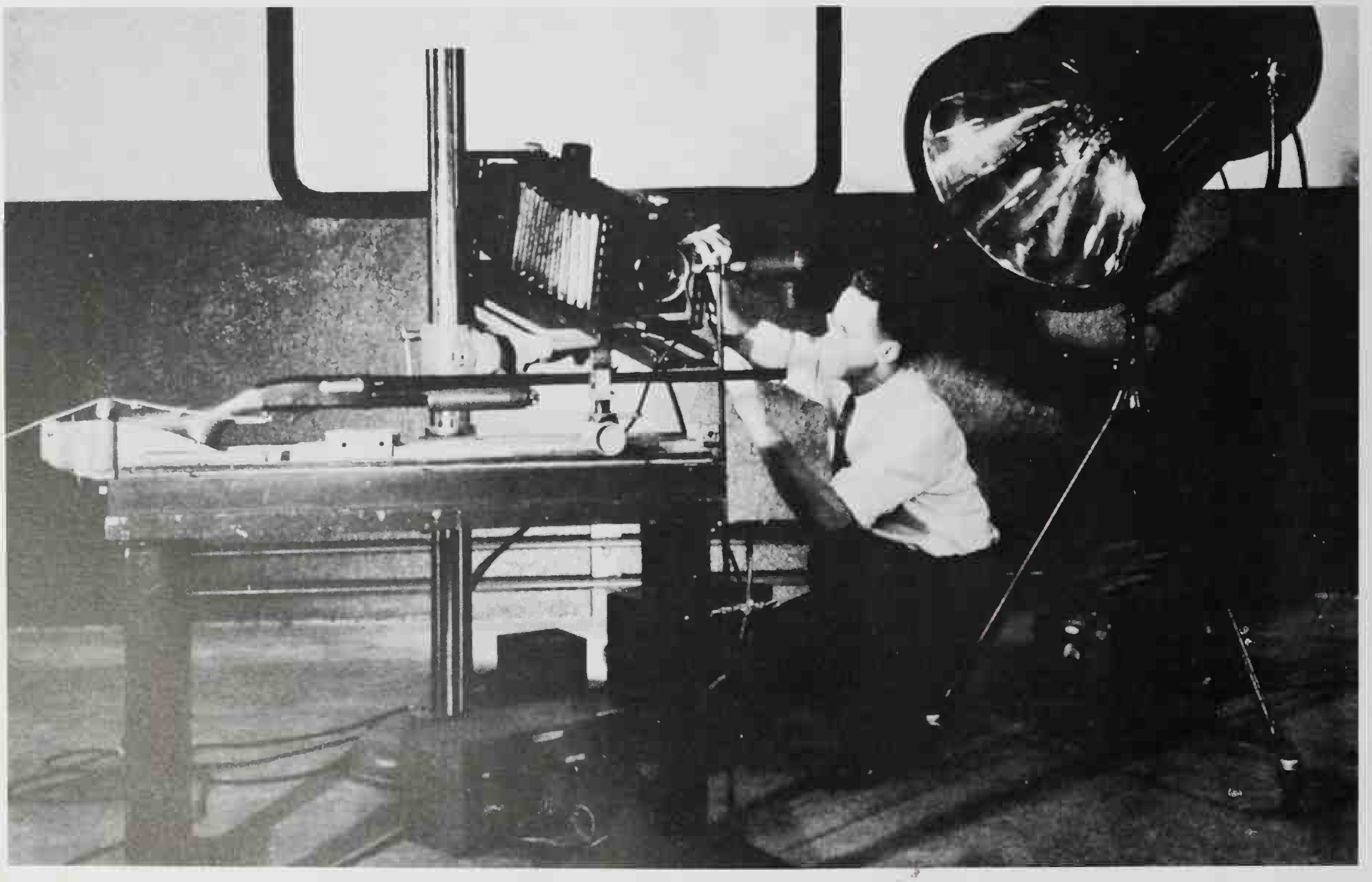
At left: Testing in the 1950s: A Remington technician places cartridges in a machine which simulates adverse conditions that exceed the most rugged of field conditions. *At right:* Another Remington technician tests new means of fabricating aluminum components for firearms during the postwar sporting arms boom of the 1940s and 50s; the war was over, and the hunt was on. *Above left:* A 1912 ad featuring the 'Remington Cubs.'

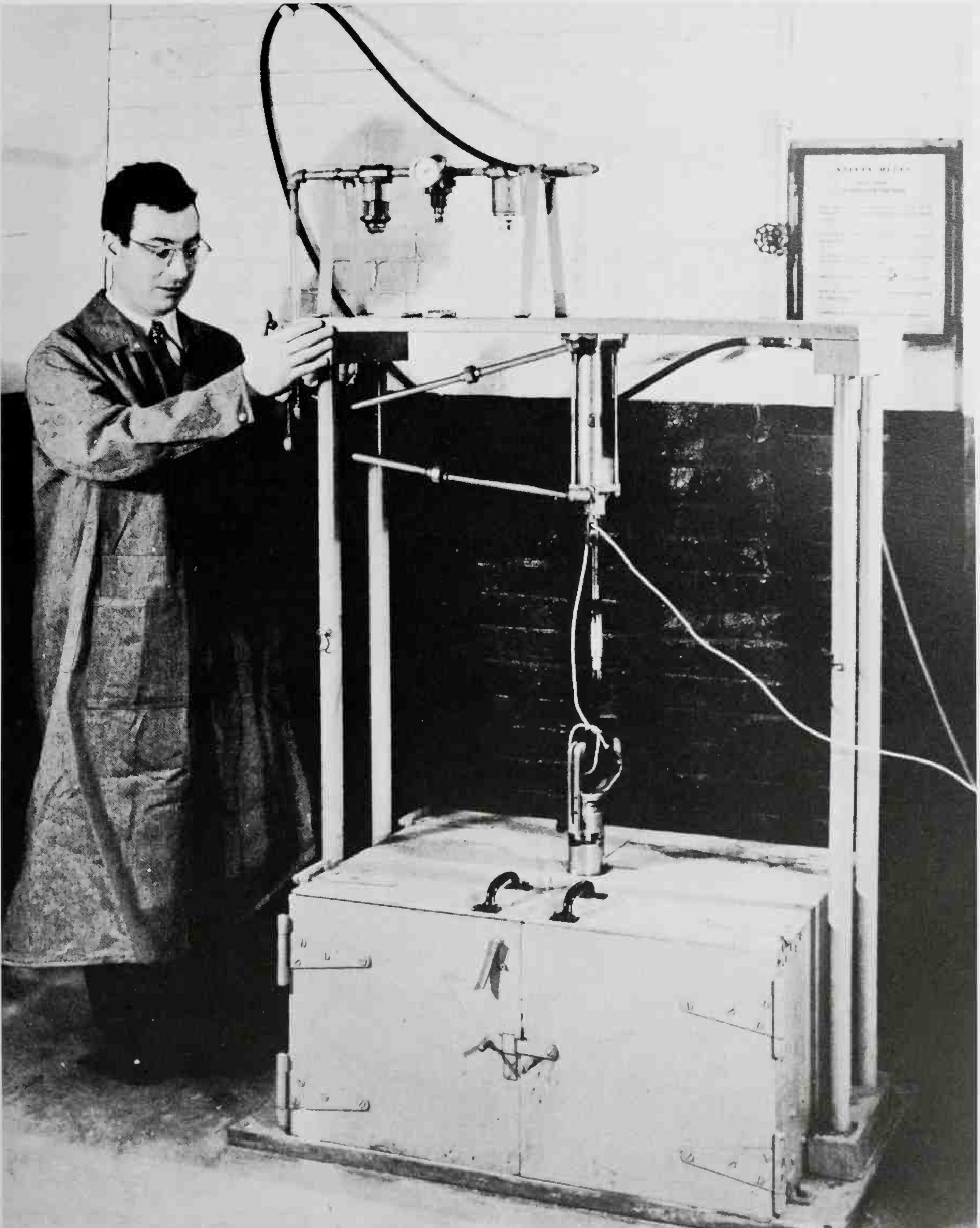
Remington's laboratories and also by special arrangement with various shooting galleries in New York state. Literally millions of rounds were fired in these tests. The guns in which the ammunition was fired were put through rigorous testing programs in which they were left uncleaned for 18 months after firing anywhere from 25 to 25,000 shots. Throughout the intervening years guns fired from 30,000 to over one million times without cleaning have still shown no signs of corrosion or erosion.

Other specimens were put into laboratory humidifiers which were run at 90 percent humidity at a temperature of 120 degrees. The outside of the barrels of these guns became encrusted with rust but in every case the bores came through in perfect condition. The new priming material formula not only failed to corrode, but actually *protected* the bores of guns through which it was fired. When the time came to actually market the noncorrosive ammunition, Remington held a contest to choose a name for it. Two men, separated by thousands of miles, had the same bright idea. WA Robbins of Jonesboro, Louisiana, and Nelson K Starr of Goshen, Indiana both suggested 'Kleanbore.' They each received a prize from Remington.

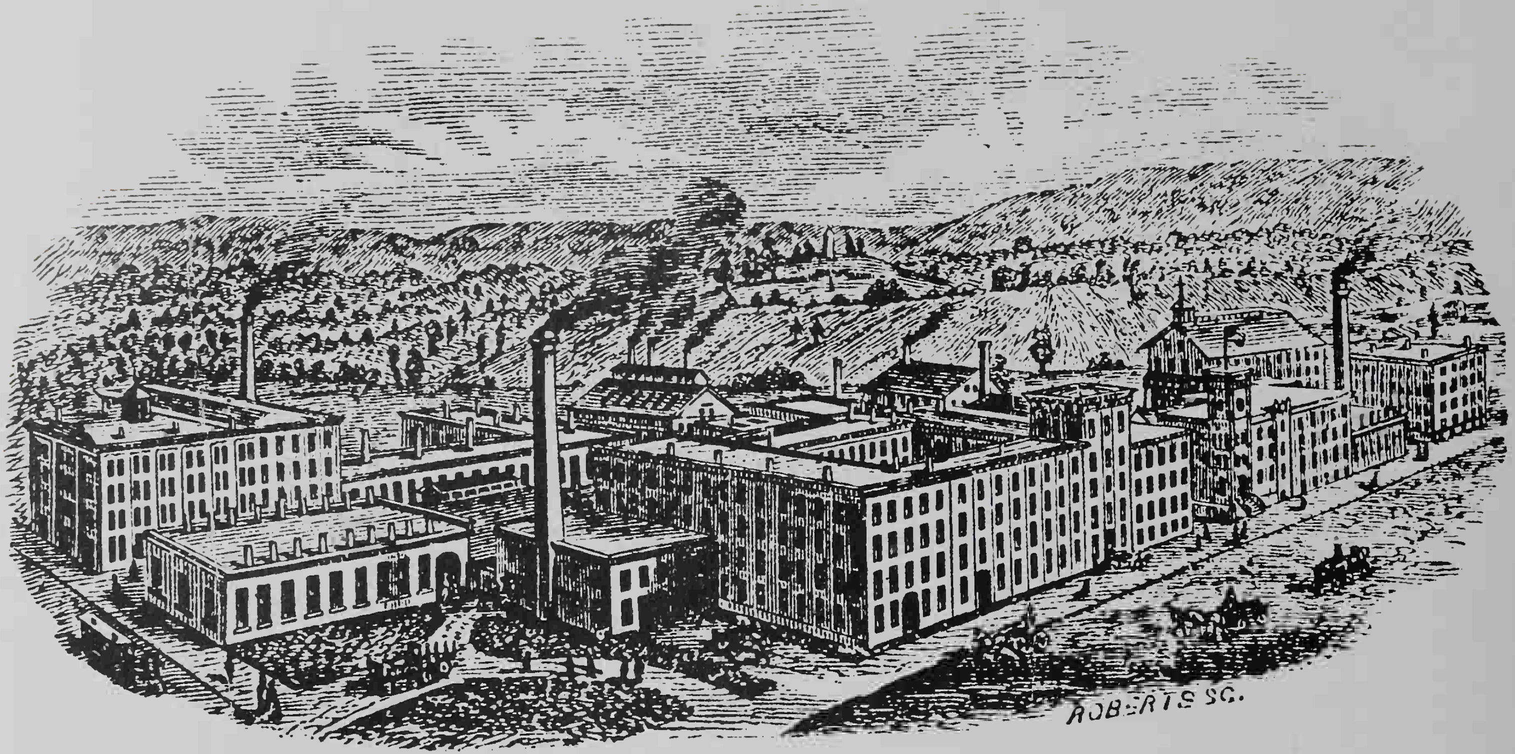
Remington introduced 'Kleanbore' ammunition to the general public in 1926, and though it is prudent to clean and oil one's firearm regularly, Kleanbore ammunition has helped to preserve many a gun bore. At present all cartridge companies make noncorrosive ammunition but, as in so many other firearm improvements, it was Remington that pioneered this revolutionary breakthrough.

20 ACCELERATOR CARTRIDGES
PETERS
20 HIGH VELOCITY
CENTER FIRE
PETERS

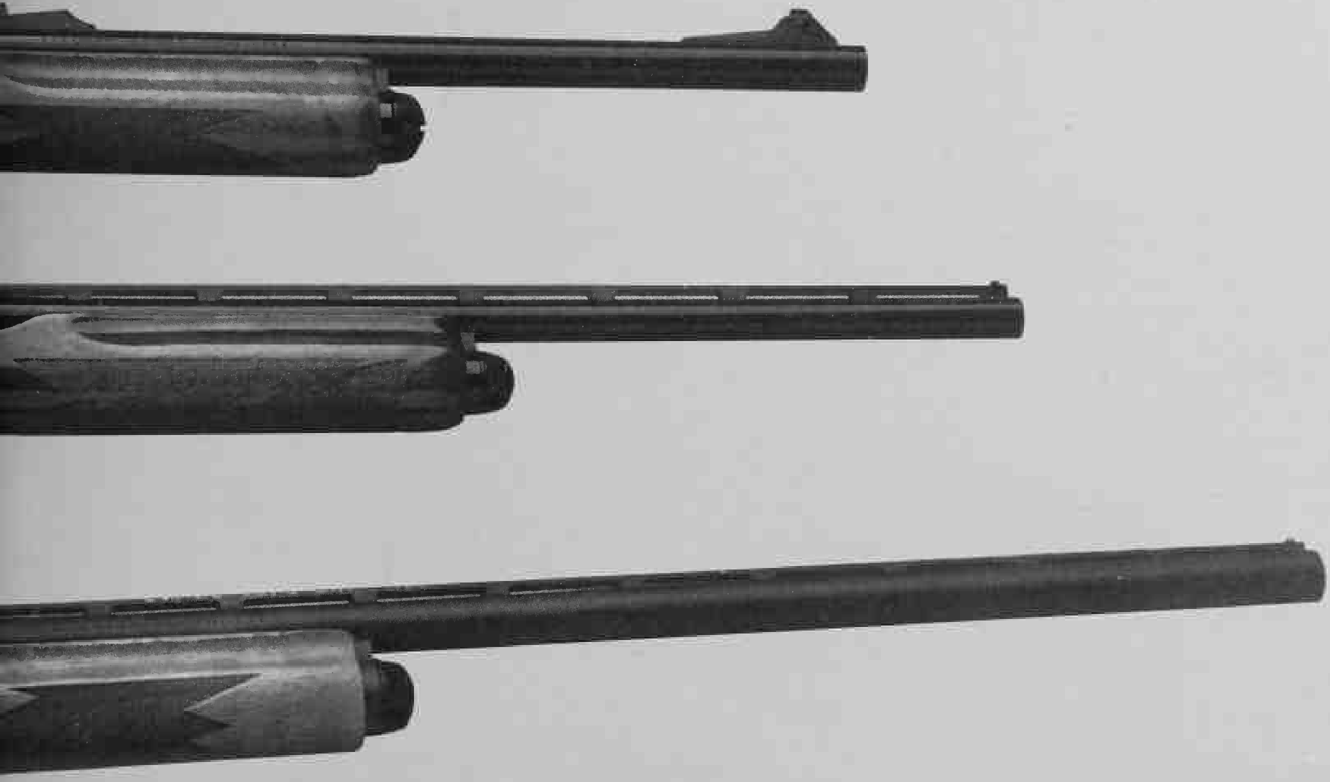




Above: **Remington's experimental industrial tools, fasteners and cartridges have long been tested by remote control devices such as this.** ***Above left:*** **Features from Remington's famous Peters line of ammunition—the new 'Accelerator' bullets which increase muzzle velocity by almost 30 percent, and Peters .44 Remington Magnum semi-jacketed hollow point bullets.** ***At left:*** **Setting up a high-speed photo ballistics study.**


ROBERTS SC.

Remington
Rem™ Oil
Remington
Rem™ Oil



Above, far left: The Remington Armory in Ilion, New York, as it was portrayed by an engraver in 1874. *Above, at top:* Remington accessories for the complete hobbyist—an all-purpose pocket knife and Rem Oil protective firearms lubricant—and an old-fashioned cleaning rod. The firearms shown *on these pages* are, from top to bottom: The Model 870 Wingmaster Deer Gun; the Model 870 20 gauge Youth Gun; and the New Model 870 Express.

Eliphalet First

Eliphalet Remington, II—'Lite' to his family and friends—lay asleep in a soft feather bed in the northeast bedroom of his father's house. Abigail, his young wife, lay beside him. The sun rose at 4:54 AM on that morning early in August 1816, and a first shaft of light, piercing the fringe of trees that rimmed the Remington fields, touched Lite's long, chiseled nose. He awoke, and remembering his plans for the day, heaved himself out of his feathered nest.

Abigail stirred and muttered, 'Is the night over already?'

'Yes,' said Lite. 'But don't you move. The women say you must be extra careful of the first child.'

'You're so good, Lite,' she answered. 'I'll keep him safe for you. Are you going to start the gun today?'

'Sure as shootin',' her husband said. 'The hay is in and things are slow at the forge. Father says I can use it.'

He put on a rough homespun shirt and pantaloons—broadcloth was for Sundays—pulled on his leather half boots, and went down to the hearty New England breakfast his mother had ready for him. He ate quickly, scarcely speaking to his parents, for in his mind he was already working the iron to form the barrel of his gun.

Legend says that young Remington asked his father for a gun; that he was refused on the grounds it was too costly, and that he went straight off and made one for himself. Legend often lies. In an era when game supplied most of the meat for every larder and the forest was still full of bears, wolves, and sleek, dangerous panthers, a gun was not a luxury but a necessity, and Lite Remington was not a man to go off without careful study and planning and make a gun by inspiration.

Remington, having carefully studied methods of gun-making, and having minutely examined all the rifles he could lay hands on, decided that he could make a better gun than he could buy, and he was quite right.

Lite finished his breakfast quickly, kissed his mother, and said to his father, 'Stop by the forge when you can and give me the benefit of your advice.'

'If you don't know more than I do about gun-making after all that studying, you'd better give it up right now,' his father answered. 'But I'll have a look at it all the same.'

Young Remington went out of the kitchen door, being careful not to bang it for Abigail's sake. He cut straight across the hay field in which the cows were now in pasture, toward the tall trees that rimmed the edge of 'the Gulph.' Ignoring the wagon track that quartered down its steep slopes to the ford near the sulphur springs, he slipped and slid down an almost vertical foot path between the great tree trunks that rose branchless for fully 60 feet before spreading out their thick canopy of leaves. The August heat was already on the fields, but in the wooded gorge the air was mostly chilly, and the steady rushing sound of the creek, rippling over its bed of boulders, made it seem cooler still.

The new stone building that housed the forge and smithy, which Lite's father, Eliphalet I, had built the year before, stood right on the water's edge. When it was operating, a wooden flume several hundred feet long carried water from a dam at the bend of the creek

Remington's Gun

Evidence of the oldest commercial firearms business in the United States. *Above:* This sleek Remington Model 600 in .243 Winchester caliber may serve to illustrate what a long way Remington firearms design has come since 'Lite' Remington first hammered out a barrel at he and his father's forge. But the flintlock that he made was no mean gun—its first public shooting trial caused many of the best shots in the land to buy barrels, parts and entire rifles that he, Eliphalet Remington II, had made. This was just the beginning of a way of thinking and a care of making that would enable the Remington Arms company to become, over the years, one of the greatest arms and ammunition makers in the entire world.

above the ford to the big waterwheel with its 12-foot wooden paddles. The water gate would remain shut today; the flume, empty; and the wheel still. Lite would not need them for the job at hand. Remington threw open the big door of the forge and left it so—it would be hot in there later. The interior of the shop was a scene of cluttered order. Nearest the doors was the wooden ox sling—stout, four-poster gallows on which oxen were hoisted to be shod since they could not give their feet to the smith as horses did. On racks along the walls hung dozens of horseshoes and even more of the little half shoes for the oxen's cloven hooves. Wagon wheels with shiny new iron tires leaned against the stone walls. In one corner were piled a heterogeneous assortment of parts for agricultural implements: harrow teeth and cultivator prongs, ox yokes, hoes, crowbars and the metal parts of other farmers' tools—including iron facings for wooden plows (it would be three years yet before Jethro Wood of Cayuga County invented the first all-metal plow).

In another heap were iron parts that the Remingtons made for the grist mills which were springing up on virtually every creek that could get up a sufficient head of water to turn a wheel. Mixed in with them were heavy sleigh shoes, curved to fit over the wooden runners of the only vehicle that could be used in that country from December to March.

In one corner of the shop stood the brick forge, its interior chimney already blackened with soot. Close beside it were the big circular tub bellows, a good six feet in diameter, mounted horizontally on a wooden frame. Within easy reach was the heavy triangular anvil, its iron column secured to a stout wooden block. The tools of the blacksmith's trade were racked handily by—sledge hammers, grooving hammers, wedge-shaped pritchel hammers for punching nail holes in the horseshoes, mandrels, rasps, paring knives, long-handled iron ladles for dishing out molten metal, chisels, gouges, files and powerful scissor tongs for handling the white-hot iron. At the south end of the building nearest to the waterwheel were big grindstones, laboriously cut from a red sandstone cliff in the Gulph.

Lite Remington hung a leather apron from his neck and went straight to the forge, where he started a fire of charcoal, which had been bought from the charcoal burners who worked their pits back in the hills—where the great trees provided an apparently inexhaustible supply of raw material. While the fire was getting started, Remington selected a rod of iron that he himself had smelted down from ore that had been mined in Frank's Fort Gulph, and from scrap iron which had been traded in by the farmers who were the Remington forge's best customers.

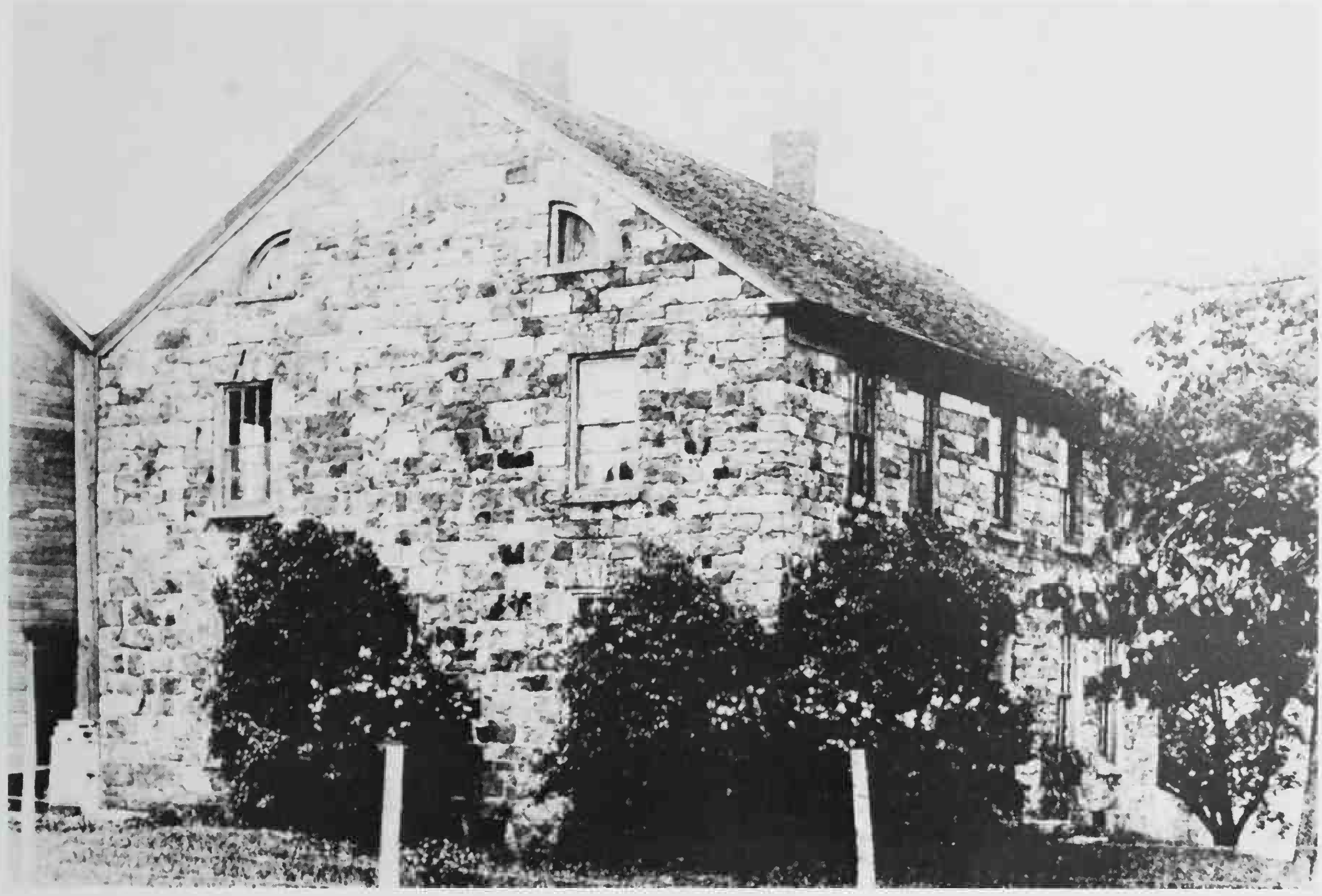
It took better than half an hour to get the fire exactly right. Then Lite shoved his bar of iron into the furnace and, swinging on the pole of the bellows, pumped it up and down, forcing jets of air into the coals which sparked and sizzled. The iron rod gradually heated to a cherry red that seemed brighter than the coals. Judging the right instant exactly from long experience, Lite seized the bar with the tongs and expertly swung it across the anvil. Holding it thus with his left hand, he raised a heavy hammer with his right.

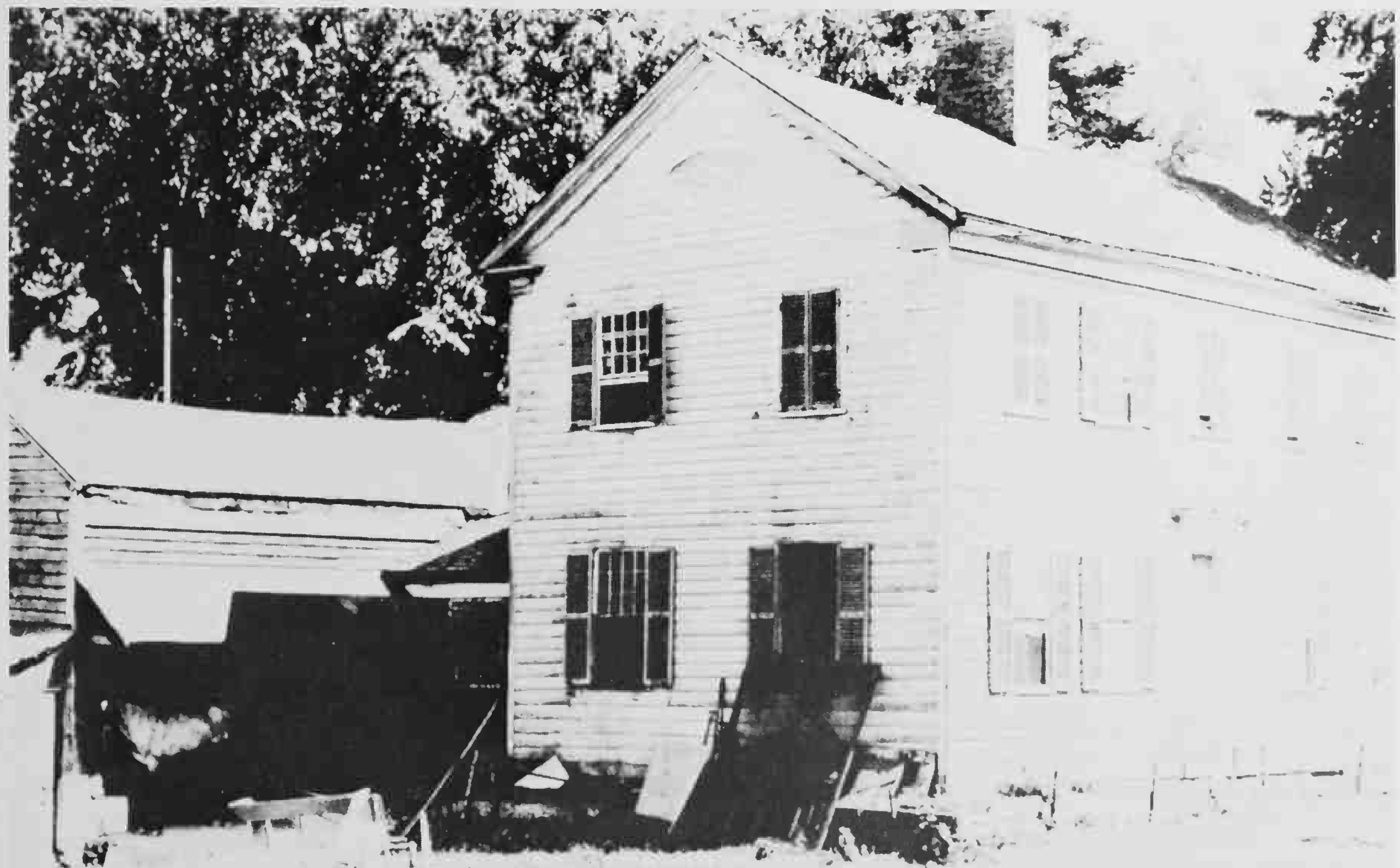
Above: **Eliphalet Remington II, aka 'Lite' Remington.** ***Above right:*** **The Remington homestead in Ilion, New York, where Lite was born, and in which he lived with his wife Abigail and his parents until the young couple moved into the house** ***(at right)*** **which Lite's dad built for them.**

Stop here and take a look at him, for as the first blow rings upon the glowing metal, history will be made, and that small bar of iron will become the first of 10 million guns bearing the name of Remington. Lite had a long, loose-jointed body which in Sunday broadcloth seemed deceptively slender. Now, poised in tension for the blow, thighs and buttocks strained the rough cloth of his trousers, his bare arms were bunched with muscle and the rigid cords of his neck made a perfect pattern of human power.

So far he might have stood as the prototype of the young workman—the essence of physical strength and skill, single of purpose and beautifully adapted to that end. But the head poised on his straining neck seemed strangely out of context with his body: it was delicate, long and well-shaped with curly, dark hair growing to a widow's peak on the high forehead. Lips and nose were finely chiseled, eyebrows delicately sketched above large, dreamy eyes. Even in the flush of furnace heat and hard labor, sweat beading and dripping from the point of his classic nose, Lite Remington looked like a *poet*, which he was!

The hammer described a perfect arc and smashed down on the hot iron, sending up a spray of sparks. With the deceptive ease of practiced skill, Remington struck again and again in ringing rhythm. The end of the rod was beaten flat to a thickness of about one half





of an inch. When it cooled from red to pale pink, Remington swung it back to the bed of the furnace and pumped the bellows once more. Thus he worked it until the rod was changed to a long metal bar, one-half inch wide and one-half inch thick. Then he worked it over again until thickness and width were as nearly uniform as human skill could make them: this was only the first step.

The legend built around that gun has it completed in a single day, but it took a practiced gunsmith a week to make a gun, and must have taken Remington at least that long. After he had forged his length of iron, he took an arbor—the core around which he must build his barrel, for there were as yet no tools in the world that would drill a straight hole through three feet or more of metal—and fixed it in his vise.

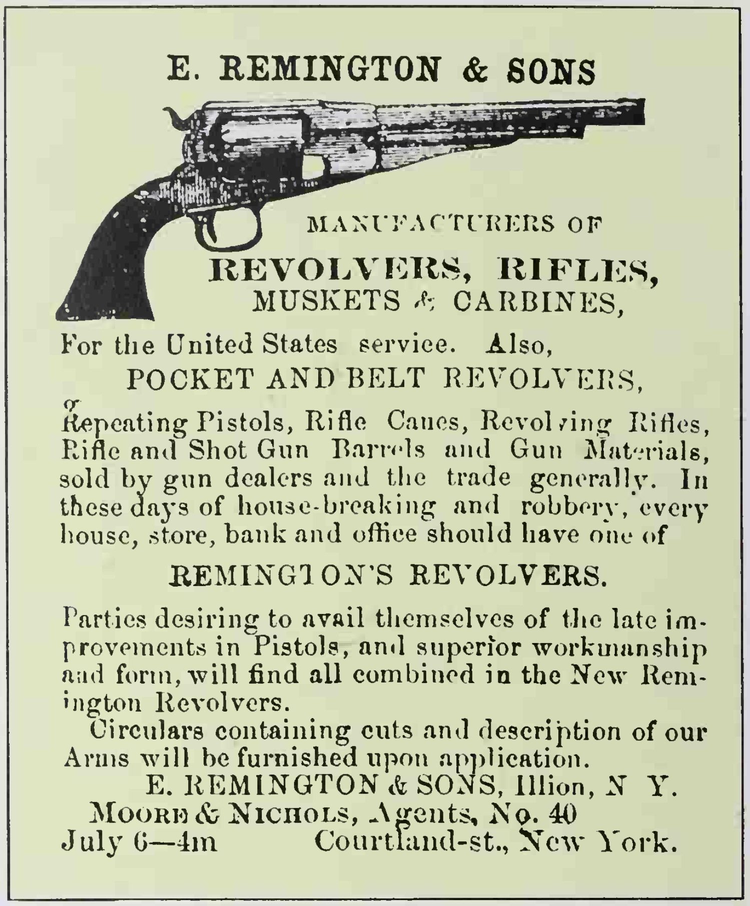
Remington brought the strip of iron to red heat again, placed an end of it over the arbor and slowly bent the softened metal around the core so that it fitted in a closed spiral. Every few inches he would have to reheat it. It was close, arduous work, done with painstaking exactitude, for the tightness and evenness of the spiral, and the quality of the weld along its seams, determined the success of the whole undertaking.

While Lite worked, his father came by to offer approval and advice, and farmer customers dropped in to purchase goods and offer their opinions—since in the farm country of those times almost every man had at least a smattering of the blacksmith's craft, every man had his opinions!

The job was done at last. Lite Remington had produced a closed spiral of metal some forty-two inches long with a .4-inch arbor running through it. He laid this spiral in the bed of coals, and this time brought it to white heat. Then he sprinkled borax and sand on it to facilitate the welding process, and seizing it in his tongs pounded it vigorously on the stone floor. This was called 'jumping,' which was meant to jar the malleable edges of the spiral strip against each other so that heat-activated molecules would run together and weld the metal spiral into a solid tube of iron. Because only eight inches could be heated at once, Remington repeated this process six times—and there was the rough barrel of the gun!

Remington then plunged it, with a hiss and flash of steam, into a tub of water to cool. When he could touch it without burning his fingers, he drew out the arbor and eagerly raised the barrel, warm and dripping; he sighted along it to answer the vital question: Was it straight? As far as his eye could tell, it was. Then he looked through it, aiming at the open doors, and it seemed to him there was a slight divergence. To check this, he made a plumb line with a piece of string and a small weight, and dropped it down the tube. About a foot below the muzzle, the string almost touched the side of the barrel.

Marking the spot carefully, Remington rested the tube on two pieces of metal and taking a soft lead hammer tapped it smartly, several times. When he tried his plumb line again it was almost right. Two more slight taps, and now the line ran dead center down the length of the barrel, which was now actually 'as straight as a plumb line.'



E. REMINGTON & SONS

MANUFACTURERS OF

REVOLVERS, RIFLES,

MUSKETS & CARBINES,

For the United States service. **Also,**

POCKET AND BELT REVOLVERS,

Repeating Pistols, Rifle Canes, Revolving Rifles, Rifle and Shot Gun Barrels and Gun Materials, sold by gun dealers and the trade generally. In these days of house-breaking and robbery, every house, store, bank and office should have one of

REMINGTON'S REVOLVERS.

Parties desiring to avail themselves of the late improvements in Pistols, and superior workmanship and form, will find all combined in the New Remington Revolvers.

Circulars containing cuts and description of our Arms will be furnished upon application.

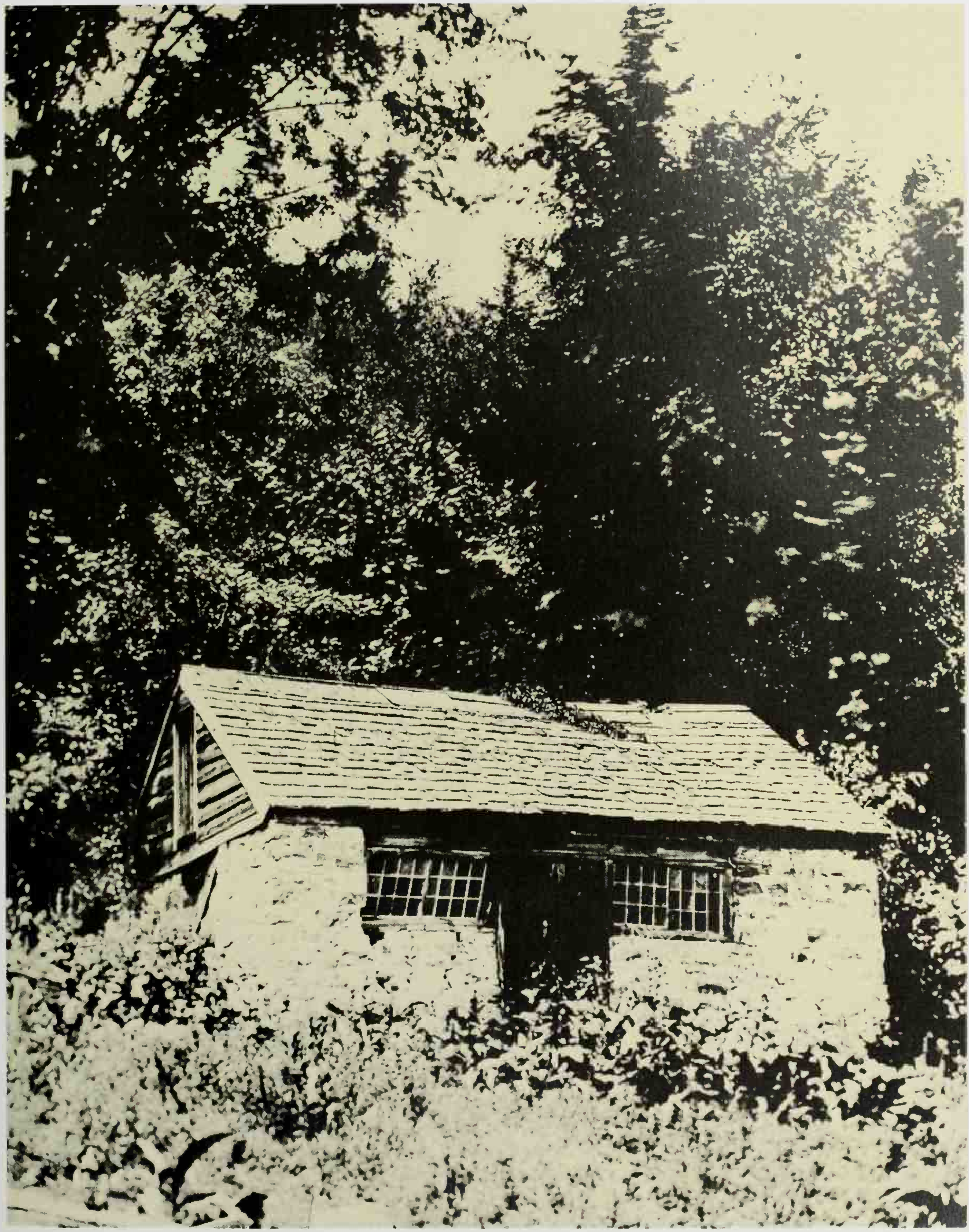
E. REMINGTON & SONS, Ilion, N. Y.
MOORE & NICHOLS, Agents, No. 40
July 6—4m Courtland-st., New York.

For the last day's work on the barrel, Lite needed power. That morning he went first to the dam and hoisted the sluice gate. A fine head of water roared down the flume. Cascading over the end, it smashed down in flying spray on the 12-foot wheel, which shuddered and groaned and began to turn. Inside the forge the grindstones were revolving. Remington drove tapering wooden spindles into both ends of his barrel to act as handles, then pressed it vertically against the grindstone. The abrasive surface bit into the iron, sending forth a bright river of sparks. Lite gradually moved it against the wheel, cutting a flat, smooth surface the length of the barrel. Eight such surfaces were cut to give the barrel the octagon-shape that was then in fashion.

It took the better part of a day to grind the barrel. When it was done, Lite lifted it and caressed the polished metal, but the inside of the barrel was still rough, and he had no tools for reaming and rifling it.

The following day, Remington put on his best black broadcloth suit so that he would be properly attired for a visit to the metropolis of Utica. He slung a knapsack—packed with plenty of meat and bread—over his shoulder, clapped a tall beaver hat on his head, and carrying his barrel in one hand and his father's rifle in the other for protection against various carnivorous animals, set out for town.

Because it was much shorter and easier going than the River Road, he followed the old Oneida Trail along the crests of the hills. As soon as he left his father's fields, he plunged into the great woods; it was a little like diving into clear, cool water. The hot August sun was strained by the almost impenetrable ceiling of leaves to a dim green gloom, through which Lite saw an endless vista of dark, columned tree trunks rising to



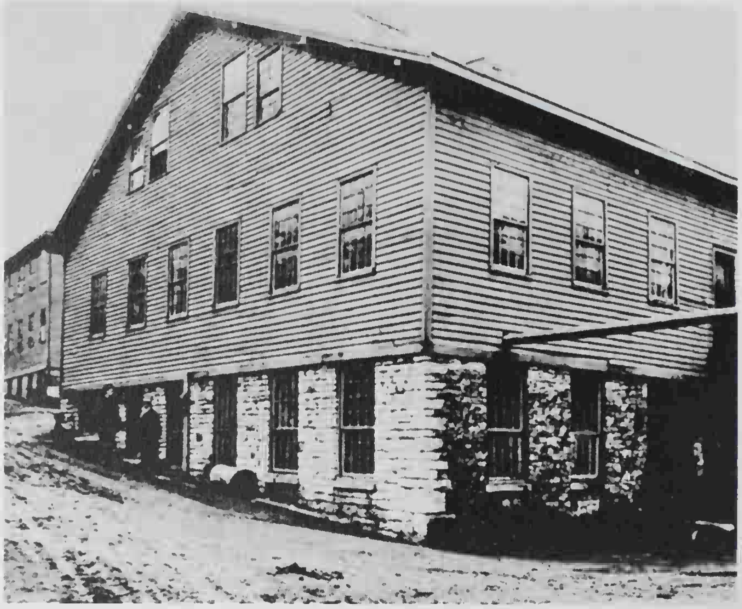
Above: The old Remington family forge down in Ilion 'Gulph,' in which Lite Remington learned the blacksmithing business from his dad, Eliphalet Remington, Senior; they made farm implements and general smithing goods, including the occasional rifle barrel. When Lite made his first firearm, a flintlock rifle, response to the accuracy of the arm was overwhelming. Demand for Lite's barrels and complete rifles grew until Lite's dad had to build his son a company headquarters—and house (see caption, page 76). *Above left:* A Remington ad of 9 November 1866.

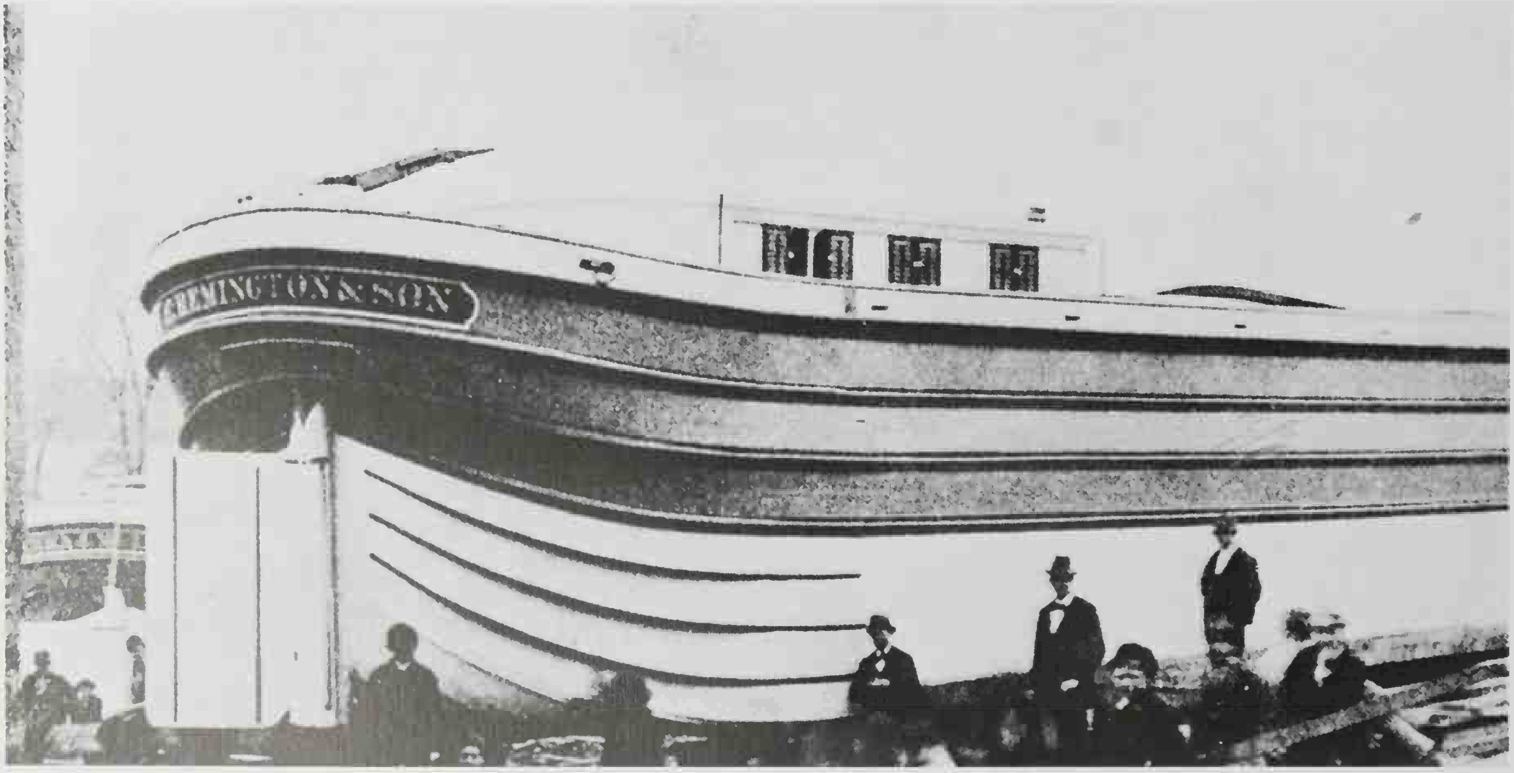
the high Gothic groining of branches and leaves. The white pole of an occasional birch was like a marker placed to show the way. Except for a thin spread of low ferns, there was no underbrush in that forest—the dense shade killed all vegetation that could not reach up to the light. The great trees stood a good 20 feet apart, so the only obstacles that Remington encountered were an occasional huge log fallen across the trail. Under his feet the forest floor, laid down through centuries by fallen trees and leaves and rotting vegetation, was delightfully springy to walk on.

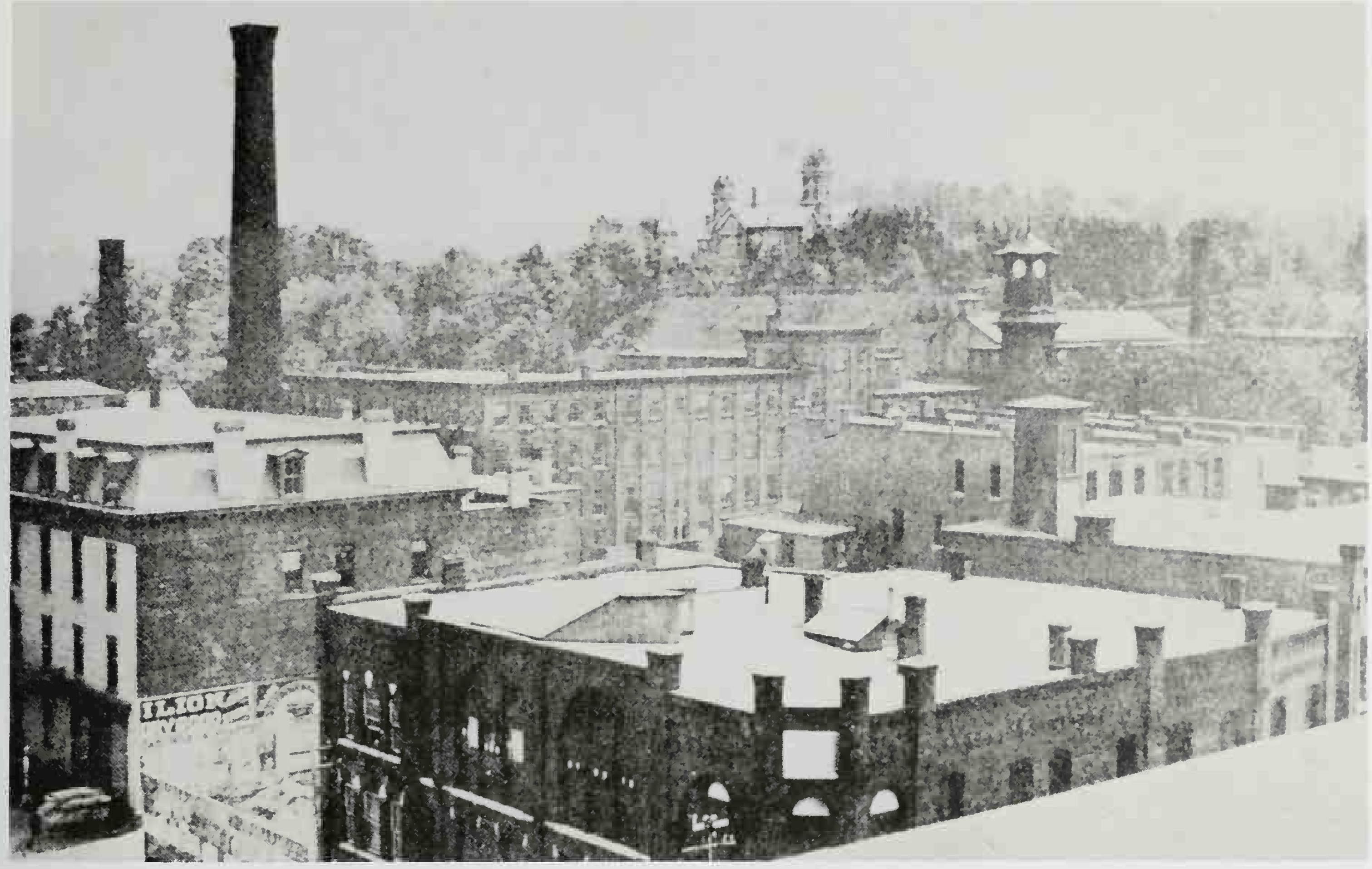
Though the forest was so vast and dim, Lite did not feel lonely, for it was anything but silent. Indeed, it was as noisily conversational as a county-wide quilting bee. Away above him in the upper stories of the trees there was a tremendous traffic of birds. Crows, blackbirds and jays wrangled and disputed with hoarse croaks and shrill jabbering. Woodcock, plover and partridge talked to each other, and wild pigeons flocked in thousands, cooing low. Squirrels raced up and down the broad, bare tree trunks like flashes of gray light, and, on the ground, sudden scurryings indicated that minks, raccoons and other such valuable varmints were getting out of the way, while occasionally a deer flashed across the field of vision.

Remington noted the lively life around him, but he never broke his easy ground-covering stride, even while his imagination delighted in picturing the creatures who made all that commotion. But fanciful though he was, he probably never produced a mental image of his own angular person, top-hatted and in formal black, pacing through the aboriginal forest.

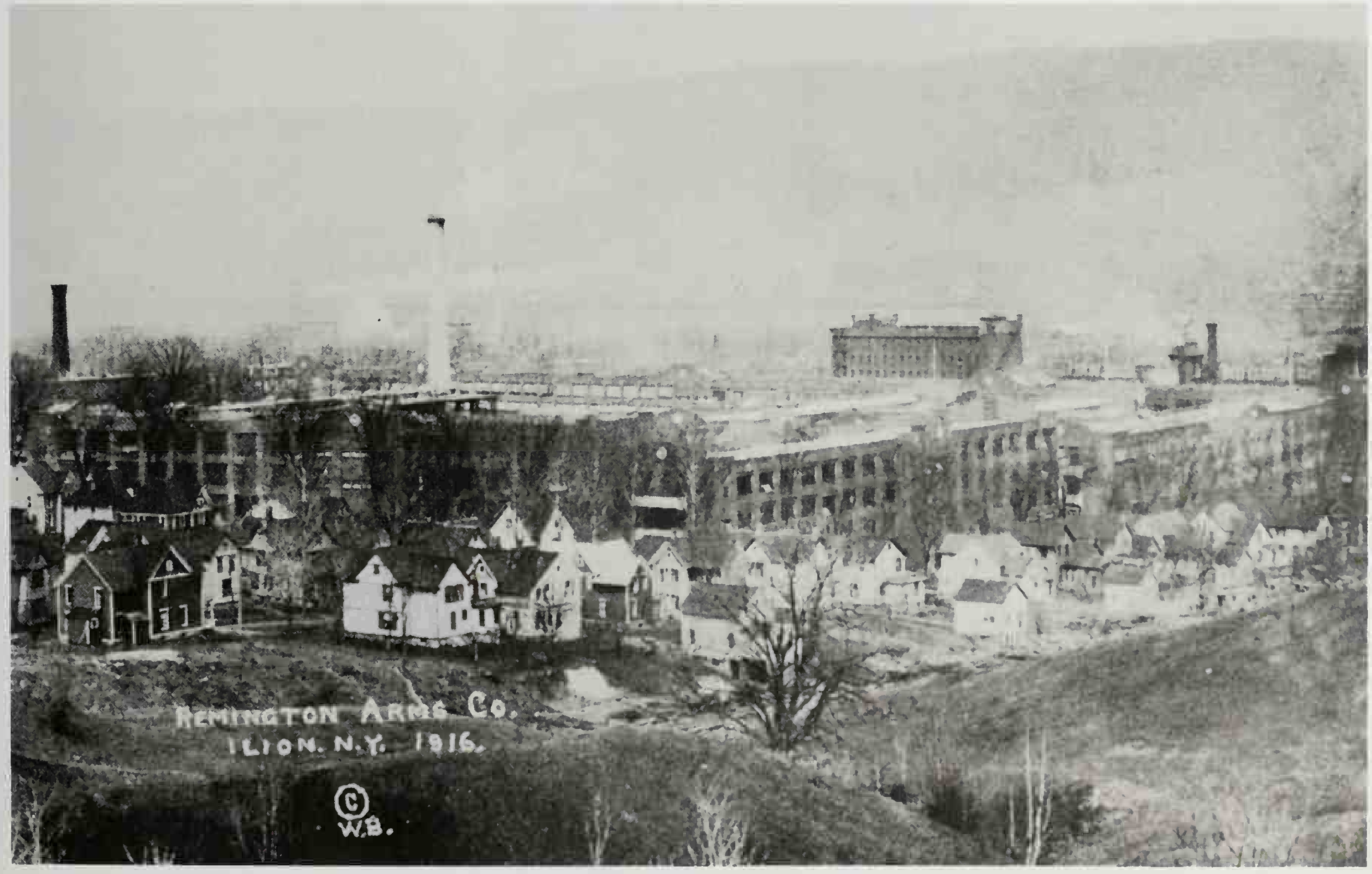
Except for a charcoal burner's aromatic pit and a thin trickle of humanity that he saw in the deep crack of Frank's Fort Gulph, he encountered no other signs of civilization until, after better than three hours walking, he struck the down slope to Utica. There the forest ended abruptly and he came out in the dazzling sunlight of open fields. Below him were the houses of

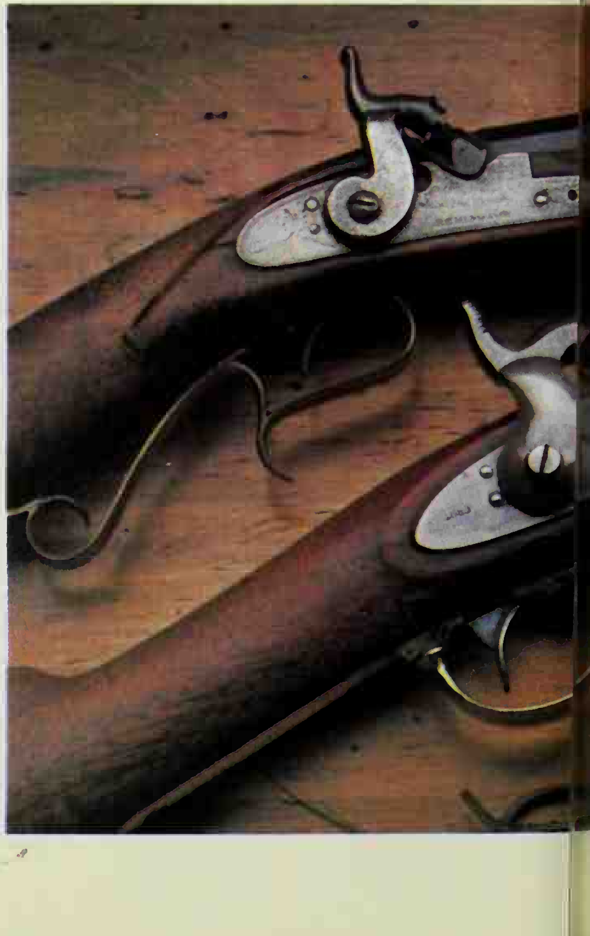






Above left: The Remington armory at Ilion, which was built in 1835. *At left:* Ilion, New York, as it was in 1883. The Remington Armory is at photo left. *Below left:* One of the canal barges which transported Remington products on the Erie Canal in the 1850s. *Above:* The Remington Arms plant at the corner of First and Morgan Streets in Ilion, New York, in the 1880s. *Below:* The Ilion plant at full capacity in spring of 1916.





Above: An exemplification of the hand fitting and finishing which goes into every fine Remington firearm. The quality that is so evident in Remington arms throughout the company's history is the result of careful attention to detail—as is witnessed to by the astonishingly rich engraving on the Remington Parker double-barrel shotgun at *above right* (which view also evidences a closeup of the engraved 'Parker' appellation of same). *At above far right* is a portrait of Eliphalet 'Lite' Remington II, with family memorabilia; *at far right* is a very fine grade Remington double derringer from the 1860s amid familiar surroundings; and *at right, left to right,* handsome specimens of a Remington pre-Civil War cap and ball rifle with octagonal barrel, and a Remington cap and ball rifled musket of Civil War vintage with adjustable rear sight.

the fast-growing town, straggling from the hills to cluster thickly at the water's edge. He saw the brand-new mills and factories, fine church spires and the turmoil of commerce along the wharves. The Mohawk River's thin blue band, curving away between the hills, was speckled with activity. It was the one break in the great Appalachian mountain barrier from the Saint Lawrence to the Cumberland Gap, and through it funneled the mass migration of settlers, pouring out of the East to fill the vast vacuum of the fertile Western plains.

The river was crowded with long, high-sided bateaux and the big eight-oared Durham boats, with square sails set before the favoring wind. Oxen drew the new Pennsylvania wagons up the roads that ran along both banks, while other families moved westward on foot or on horseback, and occasionally in fine four-horse coaches.

Nor was all the traffic upriver. The fertile farms of the Mohawk Valley, the Genessee Valley and the Finger Lakes were the breadbasket of the Eastern seaboard. Their produce, and cargoes of salt from the famous salt springs of Syracuse, were floated down the Mohawk in strange lozenge-shaped vessels—half raft, half scow—that were called 'arks.'

Utica, with its population of 1200, was the biggest city Remington knew. As he walked down the steep hill of Genesee Street, it seemed very metropolitan to him and, in fact, it made up in bustle what it lacked in size. He inquired for the shop of Morgan James, a young man about his own age, who was making himself a reputation as a gunsmith.

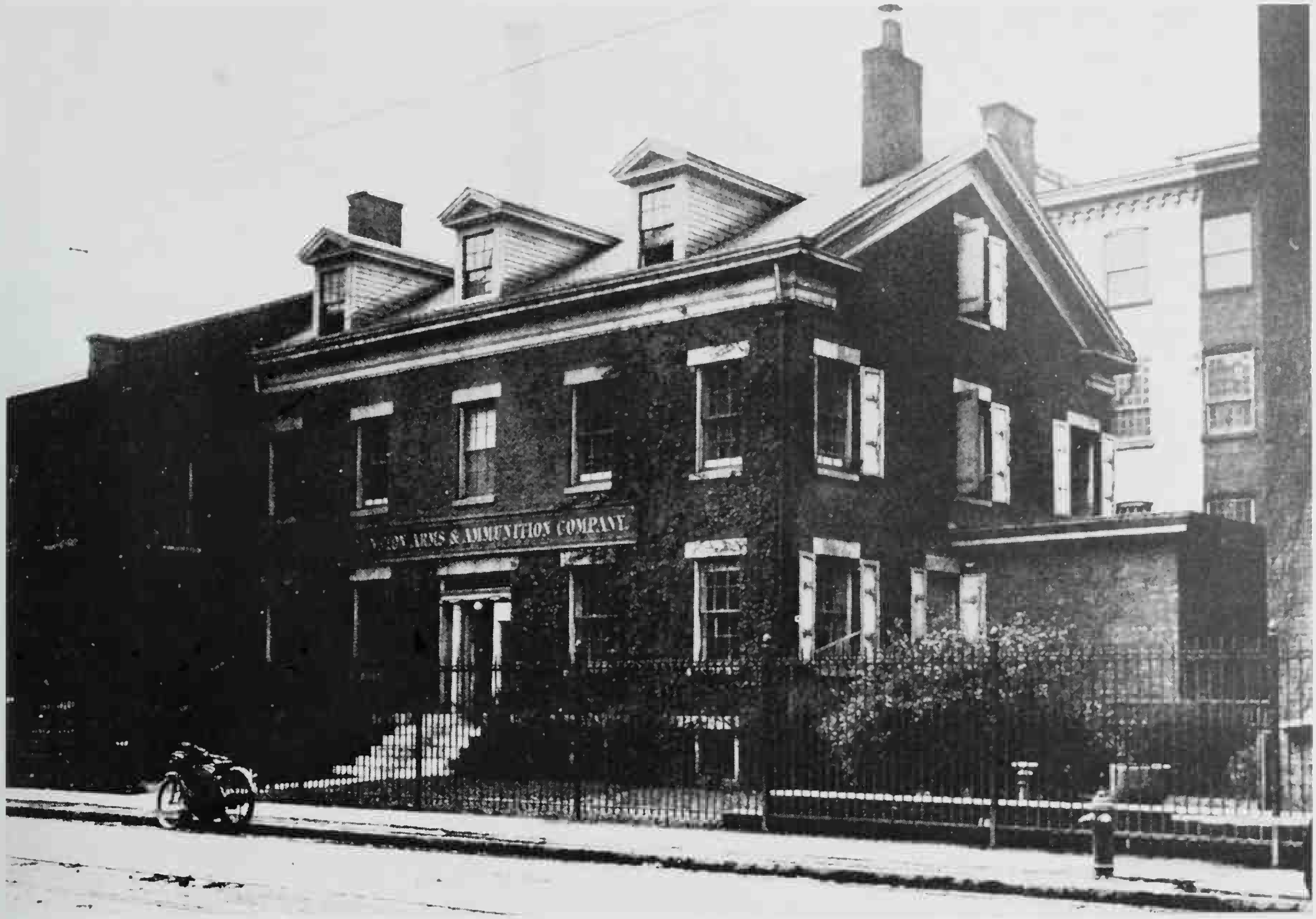
Remington approached young Mr James with his barrel, and stated his need. James took it in his hands and hefted expertly. He peered along it and through it, and turned it over and over, inspecting the forging with particular care. Lite looked on with the agonized concentration of an artist exhibiting his latest work. This was the first authoritative critique of his labors.

James soon put him out of his misery. 'That's a fine barrel,' he said. 'Straight as a string. It'll only take me a couple of hours to ream it for you, but the rifling is a long job.'

He secured it firmly in the narrow, wooden bed of his rifling machine, and introduced a nut auger mounted on the end of a slender five-foot rod. He turned the rod by a hand crank with infinite care, moving inch by inch into the barrel, cutting a smooth shining surface.

While the gunsmith worked, Remington never moved from the shop. He had no desire to explore the familiar sights of Utica. The grog shops and taverns by the wharves, crowded even at noon with teamsters and river men, were genuinely sickening to his fastidious mind. However, the new mills and the glass and cotton factories interested him intensely, for woven in with the poetic streak in his nature was a hard strand of practical ambition. The two elements of his character were twisted together like the steel and iron of an imported Damascus gun barrel to form the pattern of the man.

On previous visits to town, he had invariably visited its factories to examine new additions to their machinery and discuss economic problems with their owners. The rattle and bang of machinery, the crash of wooden spindles or the grating roar of slow-turning grindstones were a discordant symphony that drew him as strongly in one direction as the music of the forest did in another. It seemed to him a striking evidence of the fantastic prosperity of the times that experienced mill hands now made as much as 200 dollars a year. Where young workmen could do that, the sky was clearly the limit for an ambitious man with a little capital. Remington had every intention of jumping on the band wagon of industrial expansion, and he regarded the forge in the Gulph as a good base from which to leap.



At left: An early 20th century work photo of 'the Howards'—grandfather, father and son—representing 69 years of family craftsmanship at Remington. *Above:* The old Remington office building on East Main Street in Ilion, New York, which originally was Lite Remington's town house. *Below:* An 18th century photo of the Erie Canal at Ilion. See the canal barge photo on page 80. *Overleaf:* A Mohawk 600 with a Leopold 2x7 Vari-XII scope. The name Mohawk refers to the river which flows near Ilion, and the powerful Indian tribe for which it was named.

However, he had no time for factories this day; he wanted to study every move the master gunsmith made. So he ate his lunch in the shop, sharing a slab of ham and cheese and bread with James, while he cross-questioned the gunsmith about his craft.

When the reaming was done, they peered through the barrel in turn to admire its smooth sheen. Then James fastened it in the rifling machine again and, substituting a special cutting tool for the auger, began the infinitely delicate task of cutting spiral grooves inside the barrel. The bit cut a tiny fraction of an inch at a time, and James worked with an intensity that was matched only by his patience.

As soon as the light began to fade, the gunsmith knocked off. Remington spent the night with him and induced James—who loved his trade, and was to become famous at it—to talk about the history and technique of his craft. James began his tale at the beginning of America, and described the clumsy guns with which the Pilgrims had miraculously managed to supply themselves with game. Their matchlocks were so heavy that they usually required a forked stand to steady the barrel, and the charge was ignited by a slow-burning match like a piece of punk for lighting firecrackers. Then had come the wheel lock, in which a clockwork mechanism turned a steel wheel against a piece of flint throwing a stream of sparks into the priming pan. Finally, the familiar flintlock was invented by Dutch chicken thieves, who called it the *snaphance*, or hen snatcher!

All of these guns had been smooth bore and you were lucky to hit the broad end of a potato patch with one. However, German and Swiss immigrants, whose descendants are the Pennsylvania Dutch, brought the *rifle* to America. Their first rifles were German Jaegers weighing 20 pounds or more. They were unwieldy compared to the smooth-bore flintlocks then in general use, but with one you could actually hit a squirrel in the top of a tree. The trouble was that nobody could carry a Jaeger through the woods and besides that, it took special tools and about 10 minutes to reload, by which time the pioneer would likely be out of luck.

The immigrant German gunsmiths went to work on this problem. Through trading ideas among their many small, individual shops they gradually developed a long, graceful rifle that weighed less than 10 pounds and could be fired two or three times a minute. This was the 'Kentucky rifle'—it should have been called the 'Pennsylvania rifle.' It was perfected about 1730, and quickly became the most famous gun in the world.

'It was the rifle made the conquest of the Western wilderness possible,' James told Lite, 'but we Easterners (meaning New Yorkers in the parlance of those pre-Wild West days) were awfully slow about taking it up. We stuck to smooth bores until after the Revolution, and only now are rifles really becoming common hereabouts. It's still hard to get a good barrel. You've made a dandy.'

James finished the rifling job the next morning. When Remington paid him his fee—which was four double reales (two-bit pieces worth twenty-five cents each), still considered viable currency in the country districts—he felt that he had received more than his money's worth.

To complete his barrel, Remington had to bore a small touch hole near its base for the powder train, and had to forge a plug which he would screw into the rear end for the breech block. The firing mechanism was to be the then-universal flintlock. Remington forged the parts and finished them with a hammer, a cold chisel and a file. The lock consisted of a lock-plate to which he brazed a priming pan; a vertical strip of steel, which was held against the priming pan by a powerful spring; and a hammer, actuated by another spring, holding a piece of flint. When the trigger was pulled, the hammer slammed the flint down the face of the steel, uncovering the priming pan and throwing a stream of sparks into the priming powder from whence a flash of fire passed through the touch hole to the main charge.

In the evenings, Lite worked on the stock of the gun, shaping it from a straight-grained block of walnut with a draw knife, and whittling it out so that it fitted flush against the breech block, and exactly accepted the curves of the lock. He smoothed it down with a small block of sandstone—sandpaper had not been invented—and polished it with wild beeswax. The barrel was coated with hazel-brown, an excellent preservative made of uric acid and iron oxide.

On a Saturday evening, he assembled the gun, securing the stock and metal parts with hand-wrought screws and pins.

Not all the game in the world would have induced so strict a Methodist as Lite Remington to fire his gun off on Sunday. Besides, the sound of a shot breaking the Sabbath calm would have brought down on his head the ire of the Godly neighbors. But he would have been less than human had he not swung the new rifle to his shoulder 50 times that day.

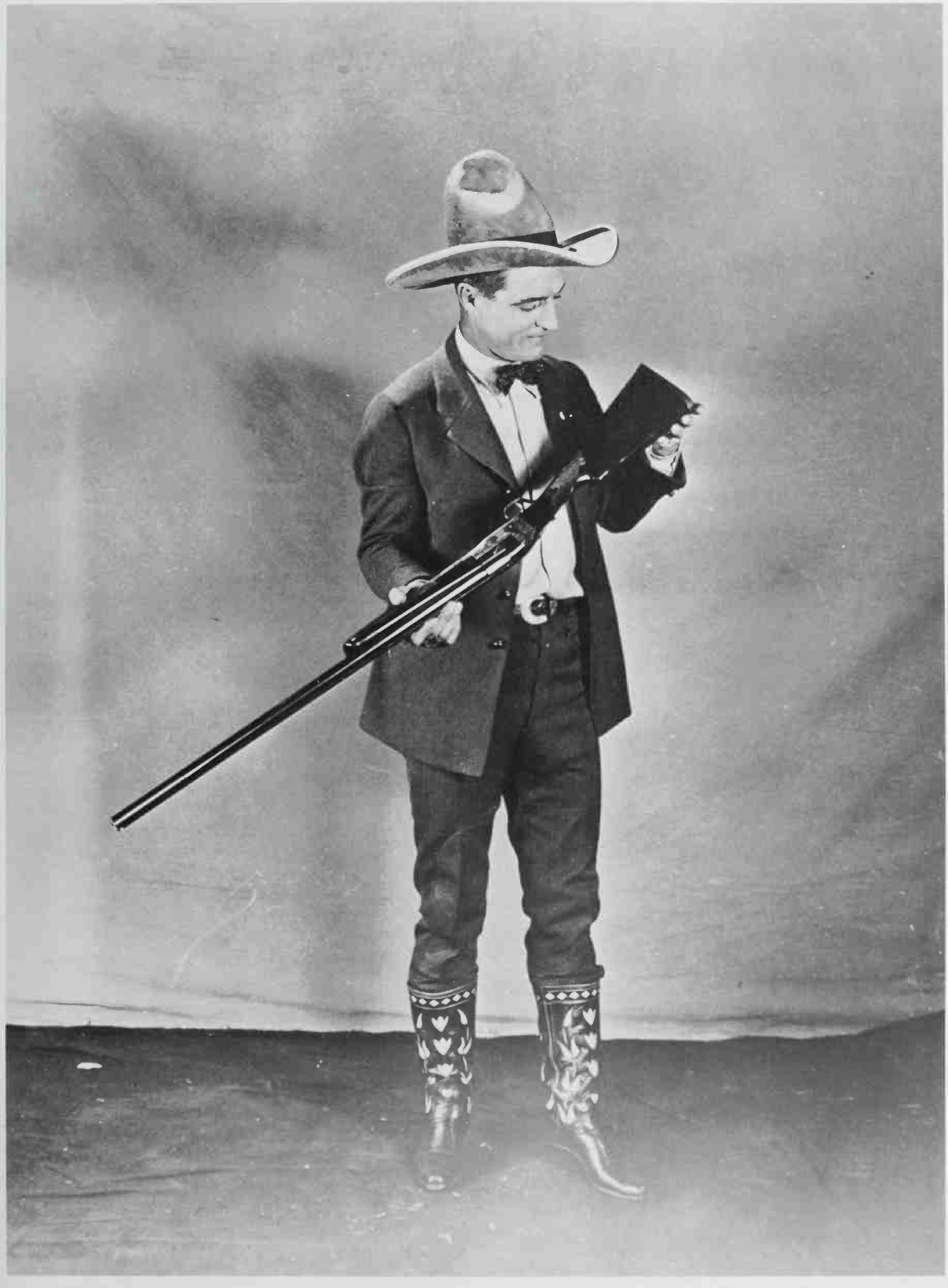
He did not need the sun to wake him Monday morning. He took his gun, powder horn, newly molded bullets and greased patches to the field in back of the house. There he loaded with a heaping measure of black powder—might as well know if she'd take it—rammed the powder home and drove in the patch and bullet. He shook a pinch of powder into the priming pan and cocked the gun. Then he laid it on the ground with its butt against a tree, and tied a piece of string to the trigger. If she was going to blow up, he was too prudent to put his face in the way. He backed off, and knew a moment of irresolution while he thought of all the work that gun had cost him. Then he pulled the string.

There was a terrific explosion and the gun gave a convulsive leap spewing clouds of pungent black powder smoke. Lite ran through the choking fumes and picked up his gun: she wasn't hurt a bit.

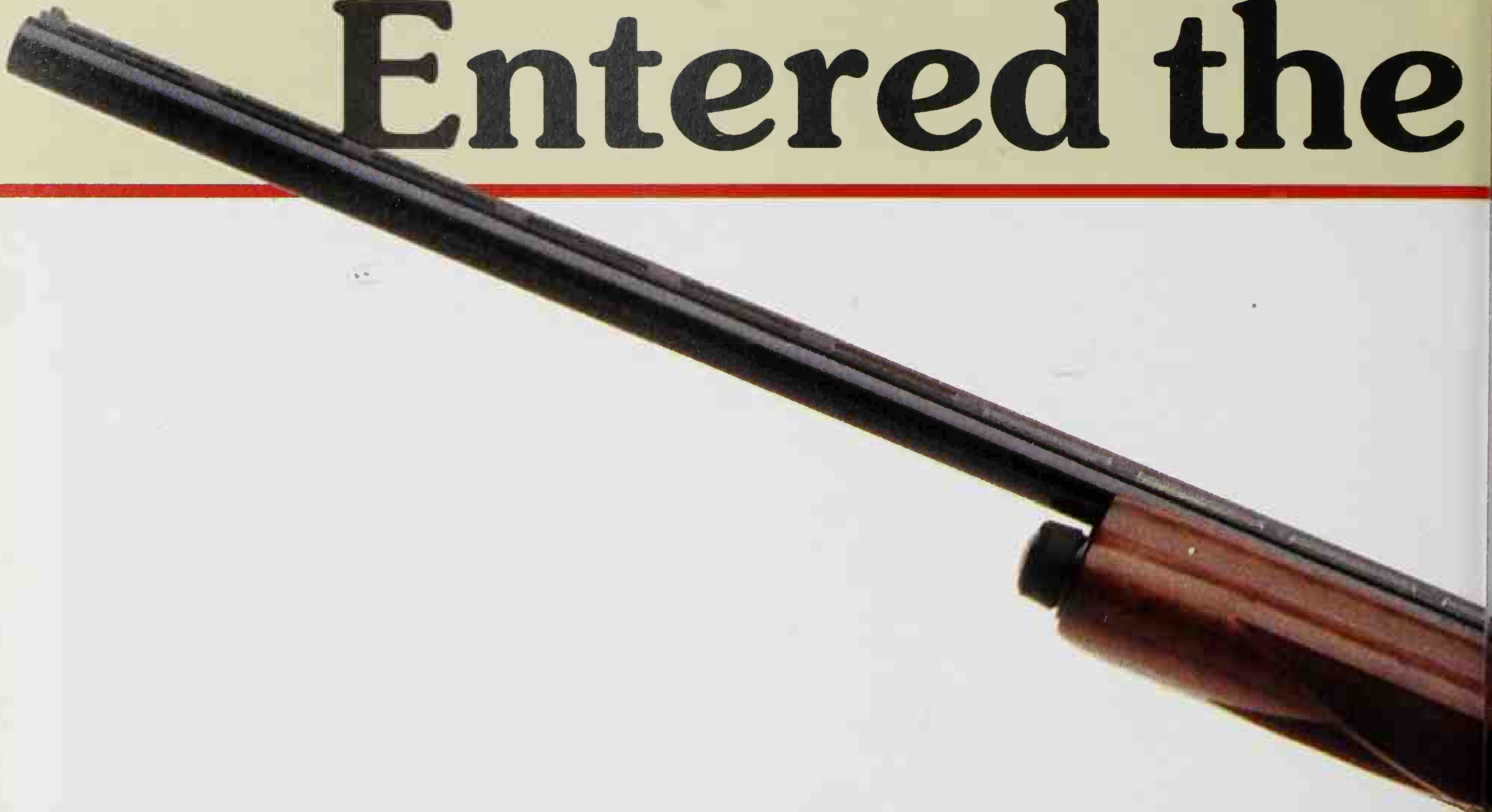
Then came the real test. Lite reloaded with a normal charge and, aiming carefully at the bole of an ancient oak, pulled the trigger. The crash made his ears ring, and smoke blanked out everything in front of him. When it cleared, he saw the oak absolutely unscathed.

He fired again with the same lack of result, but on the third try, he got the hang of the thing. The bullet hole, centered beautifully in an irregular circle of bark, was the first of many Remington bull's eyes.

***At right:* Early cowboy movie star Tom Mix admires a fine custom shotgun. Remington has long made excellent shotguns, with high-quality finish and meticulous care given to all aspects of each firearm.**



How E Entered the



It all began in the autumn of 1816, when Eliphalet entered a shooting match. Shooting matches were, at that time, the major sport of America. Tennis, golf and football were yet to be imported; it would be 20 years before the first baseball game was played at Cooperstown a couple of valleys to the south. True, the young men of the frontier had other amusements such as running races, wrestling matches and games of agility and luck, like trying to catch a greased pig. However, all these were minor accomplishments, good enough for a rough-and-tumble afternoon of fun, but were no great shakes compared to the more important art of sending a bullet as straight to the mark as the vagaries of handmade guns and highly variable black powder permitted.

Shooting for food and for survival was an essential element of life; but when shooting for sport, a man might display the skill of which he was most proud. These matches were held wherever a few men could get together in wilderness clearings on the outskirts of growing villages or towns. And the best shots competed on a county-wide basis—this counted as an organized sport in that part of the New World.

It was a county match that Remington entered. He had practiced all through August and September and was rather pleased with his marksmanship and his gun. On that fine October day, he found the crack shots and their fans gathered in a clearing near Crane's Corners. Some wore the buckskin jackets of the frontier, others wore workaday homespun shirts and pantaloons and a few stood about somewhat self-consciously in black broadcloth and beaver hats. Lite was among the last.

There were in the crowd quite a few young women, who had come to watch the menfolk display their prowess. They wore long stout woolen dresses with sunbonnets or shawls on their heads, and they chattered together like squirrels, for it was not too often that they got together for a purely social occasion. The men, too, were in high spirits—boasting of terrific shots and improbable ranges, like bringing down a running buck at 150 yards.

When the shooting began, the horseplay ended—the women stopped talking as everyone tensely waited for the ear-splitting *whomp* of those long, big-caliber rifles and strained to see the result of each shot through heavy clouds of black powder smoke.

Remington seemed as calm as one of those expressionless wooden statues that amateur sculptors of the time liked to carve from tree trunks, but as he laid his gun in a forked rest and sighted along its brown barrel, his nerves were twitching. He was afraid he might make a fool of himself.

Remington Arms Trade

Remington 11-87

Above: Carrying the Remington tradition, this fine Remington 1100 SA Skeet autoloader comes in 12 or 20 gauge, and right or left-handed versions. *Below:* Tom Yule and Dale, the older of his two sons, adjust sights on their Mohawk 600 .222s.

That he did not do; nor did he win the match—but he placed second, which was not a small thing against the best shots in the Valley.

When it was over, the chronicles say that the county champion came over to congratulate Remington, and examine his gun. Then he asked leave to try it and shot better than he had in the match.

'Where did you get it?' was his question; and one can hear Lite answering with proper pride, 'Made it myself!' It seems that Remington had some difficulty convincing the men who crowded around that he was not boasting. When they saw he was serious, they were really interested. The champ was the first to ask what Lite would charge for a barrel.

Remington did a rapid mental calculation—so much iron, use of the forge, three days' work, a trip to Utica for reaming, a fair profit.

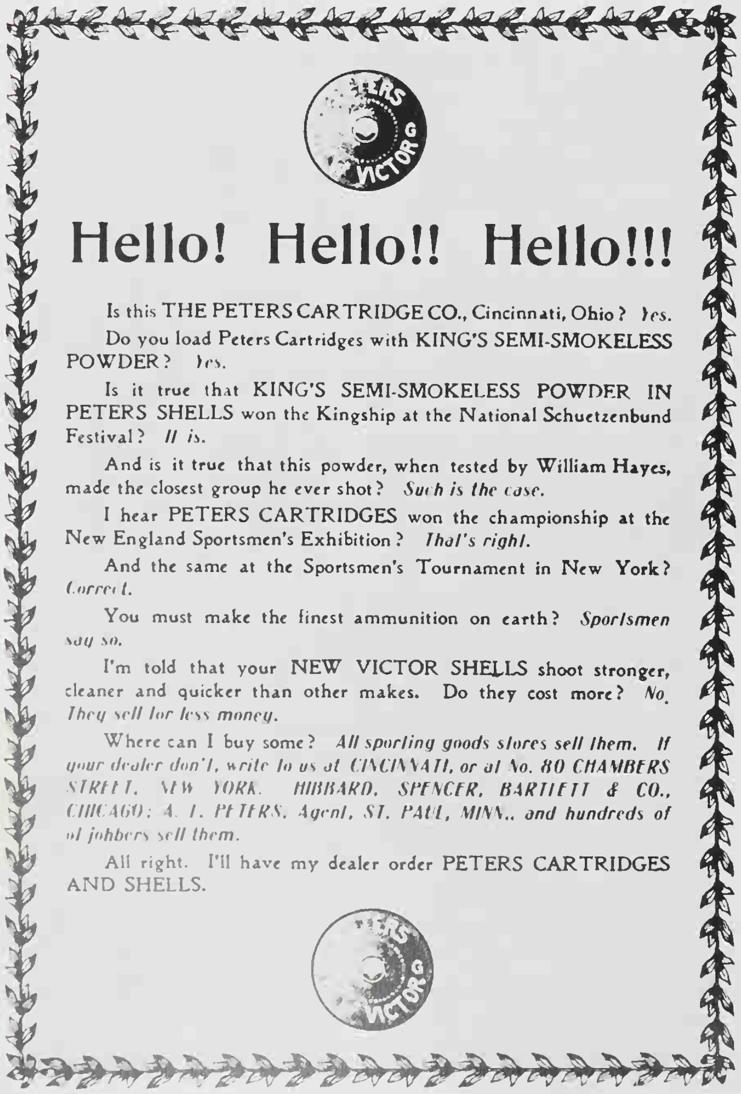
'I figure I could do it for 10 dollars,' he said.

'A fair price. When can I have it?'

Again Remington calculated. 'In about 10 days,' he said.

Other shooters wanted barrels or complete guns. Before Lite left the field, he was in the gun business.

***At right:* Montanan Tom Yule aims through his scope at a far target; Tom's Remington Mohawk 600 is a fine small game rifle, and in .222 caliber it has all the ballistic qualities needed. *Below:* The then-newly invented telephone inspired this 1899 ad for Peters smokeless powder cartridges. Though the dialogue is a bit unlikely, it gets the point across!**



Hello! Hello!! Hello!!!

Is this THE PETERS CARTRIDGE CO., Cincinnati, Ohio? *Yes.*

Do you load Peters Cartridges with KING'S SEMI-SMOKELESS POWDER? *Yes.*

Is it true that KING'S SEMI-SMOKELESS POWDER IN PETERS SHELLS won the Kingship at the National Schuetzenbund Festival? *It is.*

And is it true that this powder, when tested by William Hayes, made the closest group he ever shot? *Such is the case.*

I hear PETERS CARTRIDGES won the championship at the New England Sportsmen's Exhibition? *That's right.*

And the same at the Sportsmen's Tournament in New York? *Correct.*

You must make the finest ammunition on earth? *Sportsmen say so.*

I'm told that your NEW VICTOR SHELLS shoot stronger, cleaner and quicker than other makes. Do they cost more? *No. They sell for less money.*

Where can I buy some? *All sporting goods stores sell them. If your dealer don't, write to us at CINCINNATI, or at No. 80 CHAMBERS STREET, NEW YORK. HIBBARD, SPENCER, BARTLETT & CO., CHICAGO; A. I. PETERS, Agent, ST. PAUL, MINN., and hundreds of of jobbers sell them.*

All right. I'll have my dealer order PETERS CARTRIDGES AND SHELLS.

The Death E Remington

# of Senior

Since building his first gun, young Remington had almost imperceptibly assumed the management of his family's foundry business. His father continued to run the agricultural manufacture and to do most of the building, but the rapidly expanding gun business was in Lite's hands, and the decisions concerning it were his. Soon, Lite's father took charge of building the little frame house on what is now Otsego Street, which was to be his son's temporary headquarters.

All the lumber for it was carted down from the Gulph in big drays pulled by four powerful horses each. Early on the morning of 22 June 1828, Eliphalet Remington I superintended the loading of a dray from the piles of 20-foot planks that were stacked in the drying yard near the sawmill. Then he mounted to the top of the high sweet-smelling load, while a young driver gathered up the reins. It was a hard pull up the hill, but the going was easier on the Cedarville Road. They passed the Remingtons' stone house, went down the hill into the Gulph again and crossed the wooden bridge with the dray's big, iron-tired wheels rumbling on the boards and the measured stamp of the horses' hooves like the rolling thunder of distant cannon.

Where the gorge cut between the crests of the hills its walls were several hundred feet high and a scant 200 feet apart. Here the untouched forest still stood in its somber splendor, and the bright morning was dimmed to a dusk so deep that the teamster halted to light his lanterns. Their yellow light gleamed dimly on the huge boles of the trees, and threw fantastic shadows as the dray moved on.

Beyond the heights, the road pitched sharply downward, and the horses braced themselves against the breeching straps to hold back the load while the driver leaned on the long lever of his brakes. Jolting and swaying, they moved slowly down the steep hill until, where the road made an abrupt curve to follow the course of the creek, they came to a sink hole. As one wheel dropped into it, the strain was all one way on the piled-up timbers. They slid a little between the holding stakes, and the whole load canted suddenly, pitching Remington off and ahead. There was no stopping the momentum of four horses and a heavily-loaded dray. The horrified driver tugged frantically at the reins and braked with all his might, but the equipage rolled inexorably forward, and a six-foot, iron-shod wheel passed over the dark body in the road.

Five days later Eliphalet Remington, father of Eliphalet Remington II—who was even then embarking on one of the greatest American enterprises in history—died in the fine stone house he had built in the wilderness. He died and his son went on, carrying the family name far beyond their little foundry.

Above right: **Tradition shines in an F-Grade Remington Custom Shop Model 1100 SA Skeet gun. *At right:* Part of the Remington Museum in Ilion, New York. *Overleaf:* Movie star Audie Murphy, and his sawed-off Remington Model 1882 shotgun in the 1960 movie *Hell Bent for Leather.***

A Glossary of Remington Arms

Company Update

The close of World War II gave Remington the opportunity to retool its facilities to produce sporting arms. Large numbers of returning GIs were eager to pit themselves against less deadly foes than the war had provided. Hunting in America became a national passion with widespread popularity. North America was literally rediscovered as the habitat of many types of game suitable for sport hunting. Accordingly, Remington marketed numerous models of rifles and shotguns to suit the tastes and needs of everyone from the big game hunter to the field bird shooter. Bolt action rifles, target and sporting rifles, slide-action repeaters and autoloading guns were produced. Many advances were made in both the design of stocks and the ballistic characteristics of ammunition. It was a natural consequence, therefore, that Remington should involve itself heavily in various conservation movements. That same commitment is maintained today.

A glance at modern Remington product catalogues reveals that the company is presently marketing no fewer than three shotgun product lines, a half dozen or so rifle lines and a series of target rifles. All of this is in addition to both center fire and shot shell ammunition of almost countless types, sizes and specifications. However, a large product line has not meant that Remington has slackened its attention to detail. Their Custom Gun Shop caters to those who dream of owning a truly fine firearm. These custom guns are crafted one at a time to the dimensions, taste and style of the buyer. The F Grade Shotgun with Gold is one of two custom-grade shotguns available with personalized inlay and engravings. Various hunting rifles are also available from the custom shop, including the Grade Four Model 700 Rifle, the Model 40-XR Custom Sporter, the Model 700 Safari Grade Rifle, the Model 7 Custom with Kevlar Stock and the Model 700 Custom KS Mountain Rifle. The Custom Shop even produces a handgun known as the New Custom XT-100 Heavy Barrel in .223 Remington.

Recently, Remington undertook to revamp its advertising, marketing and distributing techniques to better serve its many loyal customers. Remington prides itself in being committed to the quality of the hunting life. Their logo reads, very truthfully, 'Remington Country—It's a way of life since 1816.' That committment also produces a rare fact for a modern manufacturer in the world arena today: *Every* part of *every* Remington gun is not only designed, but built *and* tested in the USA.

Remington Handguns

Remington-Beals First Model Beals Pocket Revolver. Made circa1857–1858. Total quantity estimated between 4500 and 5000.

Percussion; .31 caliber. Five-shot round cylinder; three–inch octagon barrel.

Remington-Second Model Beals Pocket Revolver. Made circa 1858–1860. Total of about 1000.

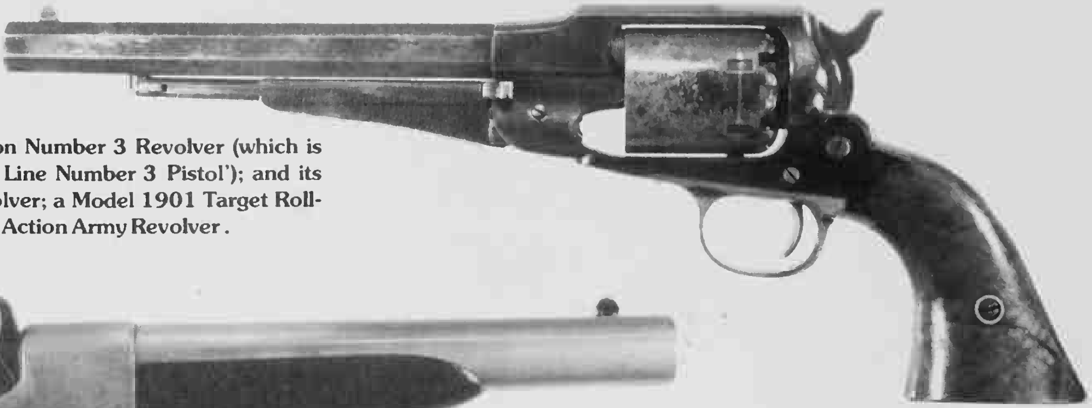
Percussion; .31 caliber. Five-shot round cylinder; three–inch octagon barrel.

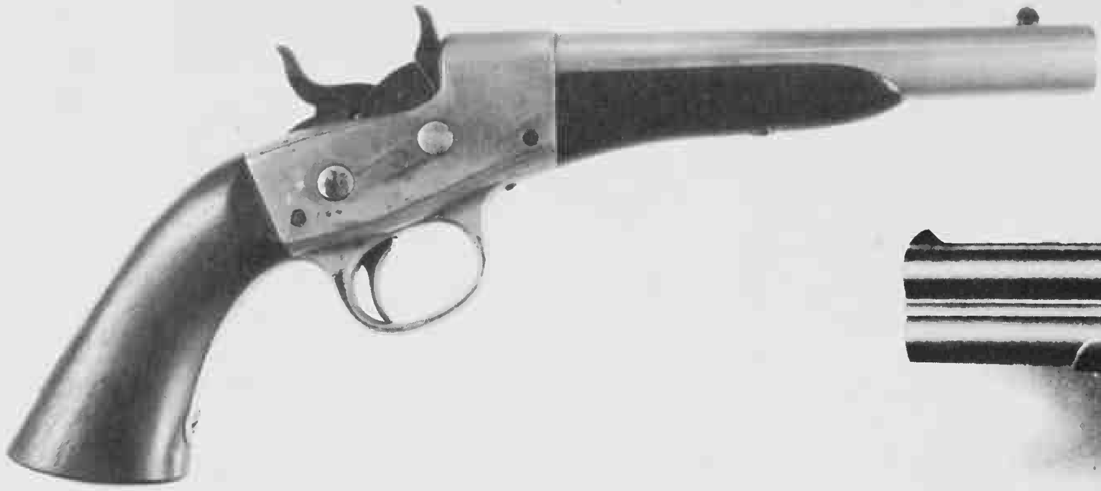
Remington-Third Model Beals Pocket Revolver. Made circa 1859–1860. Total quantity about 1000 to 1500.

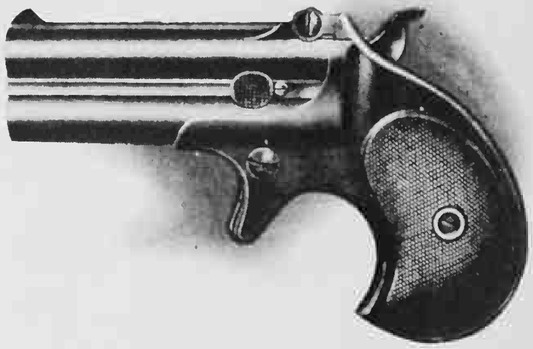
Percussion; .31 caliber. Five-shot round cylinder; four–inch octagon barrel, spur type trigger.

At top of page: The Remington hunting arms logo—'Remington Country: It's a Way of Life.' *At right:* Tom Yule's sons Tim (left) and Dale (right) with a canine friend. Tim holds his .22 caliber single shot Model 514, and older brother Dale has his dependable Mohawk 600 .222 in hand.

These pages, from immediate right, counterclockwise: A Remington-Beals Army Model Revolver; a Remington Model 1865 Navy Rolling Block Pistol; a Remington Model 95 Double Derringer; a Remington Number 3 Revolver (which is often erroneously referred to as a 'New Line Number 3 Pistol'); and its design heir, a Remington Number 4 Revolver; a Model 1901 Target Rolling Block Pistol; and a Model 1890 Single Action Army Revolver.







Remington-Rider Pocket Model Revolver. Made circa 1860–1873; with altered specimens made for .32 rimfire metallic cartridge after 1873. Estimated quantity approximately 20,000.

Percussion; .31 caliber. Five-shot tapering cylinder; three–inch octagon barrel. Large, oval-shaped brass trigger guard.

Remington-Beals Army Model Revolver. Made circa 1860–1862. Quantity made estimated between 2000 and 3000.

Percussion; .44 caliber. Six-shot round cylinder; eight–inch octagon barrel.

Remington-Beals Navy Model Revolver. Made circa 1860–1862. Total quantity estimated at 15,000. Substantially identical in appearance to the Beals Army, but slightly smaller.

Percussion; .36 caliber. Six-shot round cylinder; 7.5–inch octagon barrel.

Remington-Rider Single Shot Derringer, aka 'Parlor Pistol.' Made circa 1860–1863. Total quantity less than 1000.

Remington Zig-Zag Derringer, aka 'Zig-Zag Pepperbox.' Made circa 1861–1862. Total less than 1000.

Caliber .22 short rimfire.

Remington Model 1861 Army Revolver, aka 'Old Model Army.' Made circa 1862. Total quantity estimated between 9000 and 12,000.

Percussion; .44 caliber. Six-shot round cylinder; eight–inch octagon barrel.

Remington New Model Army Revolver. Made circa 1863–1875. Total quantity estimated approximately 132,000.

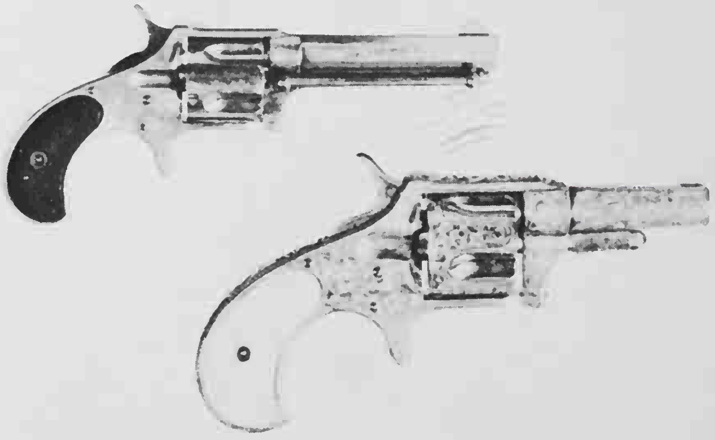
Percussion; .44 caliber. Six-shot round cylinder; eight–inch octagon barrel.

Remington New Model (Single Action) Belt Revolver. Made circa 1863–1873 in percussion; made in cartridge model subsequent to 1873. Total quantity estimated from 2500 to 3000.

Percussion; .36 caliber. Six-shot round cylinder; 6.5–inch octagon barrel.

Remington-Rider Double Action New Model Belt Revolver. Made circa 1863–1873 in percussion with subsequent production as metallic cartridge model. Total quantity estimated at 5000.

Percussion; .36 caliber. Six-shot round cylinder; 6.5–inch octagon barrel.



Remington New Model Police Revolver. Made circa 1863–1873 in percussion with subsequent production as factory alterations to cartridge. Total quantity estimated at 18,000.

Percussion; .36 caliber. Five-shot round cylinder with safety notches on cylinder shoulder. Octagon barrel in 3.5–inch, 4.5–inch, 5.5–inch and 6.5–inch lengths.

Remington New Model Pocket Revolver. Made circa 1863–1873 in percussion; subsequent production as metallic cartridge conversions. Total quantity estimated at 25,000.

Percussion; .31 caliber. Five-shot round cylinder; safety notches on cylinder shoulders. Octagon barrel, available in three–inch, 3.5–inch, four–inch and 4.5–inch lengths.

Remington-Elliot Derringer 22 RF, aka 'Pepperbox.' Made circa 1863–1888. Total quantity combined for this .22 caliber with the larger .32 caliber model estimated at 25,000.

Caliber .22 rimfire.

Remington-Elliot Derringer 32 RF, aka 'Pepperbox.' Made circa 1863–1888. Total quantity of this and the .22 caliber type estimated at 25,000.

Caliber .32 rimfire.

Remington Vest Pocket Pistol, aka 'Saw Handle Derringer.' Made circa 1865–1888. Total quantity estimated at approximately 25,000.

Calibers .30, .32 and .41 rimfire.

Remington Model 1865 Navy Rolling Block Pistol. Made circa 1866–1870. Total produced originally estimated at approximately 1000; since revised to approximately 6500.

Caliber .50 rimfire; single shot; 8.5–inch round barrel.

Remington Double Derringer, aka 'model 95 Double Derringer,' aka 'Over-Under Derringer.' Made circa 1866–1935. Total quantity estimated at over 150,000.

Caliber .41 rimfire short; three–inch round, superposed barrels.

Remington-Elliot Single Shot Derringer. Made circa 1867–1888. Total quantity estimated at approximately 10,000.

Caliber .41 rimfire; 2.5–inch round barrel.

Remington Model 1867 Navy Rolling Block Pistol. Made circa early 1870s. Total quantity unknown.

Caliber .50 center fire.

Remington-Rider Magazine Pistol. Made circa 1871–1888. Total quantity estimated at approximately 10,000.

Caliber .32 extra short.

Remington Model 1871 Army Rolling Block Pistol. Made circa 1872–1888. Total quantity approximately 6000 plus.

Caliber .50 center fire. Single shot; eight–inch round barrel.

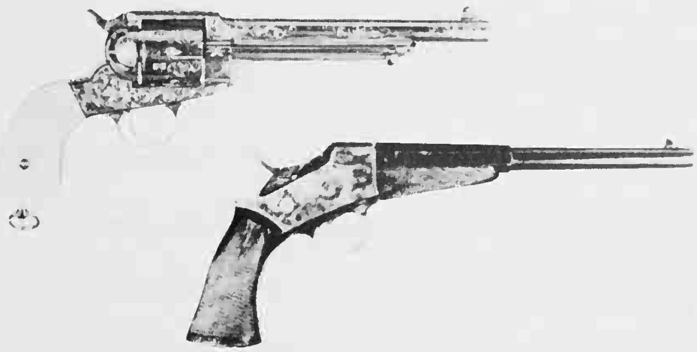
Remington Number 1 Revolver—New Model (Smoot's Patent). Probably most easily termed 'Remington-Smoot New Model Number 1, aka erroneously 'New Line Revolver Number 1.'

Remington Model 1875 Single Action Army Revolver. Made circa 1875–1889. Total quantity estimated approximately 25,000.

Caliber .44 Remington center fire.

Remington Iroquois Pocket Revolver. Made circa 1878–1888. Total quantity estimated approximately 10,000.

Caliber .22 rimfire. Seven-shot plain or fluted cylinder; 2.25–inch round barrel.



Remington Model 1890 Single Action Army Revolver. Made circa 1891–1894. Total quantity approximately 2000.

Caliber .44–40 center fire. Six-shot cylinder; 5.5–inch or 7.5–inch round barrel.

Remington Model 1891 Target Rolling Block pistol. Made circa 1892–1898. Total quantity shown on factory records at 116; however, larger quantities are possible.

Calibers .22 long and short rimfire; .25 Stevens; .32 S&W rimfire and center fire. Single shot; 10–inch half octagon/half round barrel.

Remington Model 1901 Target Rolling Block Pistol. Made circa 1901–1909. Total of 735 made, as indicated by factory records.

Calibers .22 short and long rifle rimfire; .25-10 rimfire; .44 S&W center fire. Single shot; 10–inch half octagon/half round barrel.

Remington Mark III Signal Pistol. Made circa 1915–1918. Total quantity approximately 24,500.

Ten gauge chambered for a special shot type shell charged with special powder only intended to fire flares. Single shot, nine–inch round iron barrel.

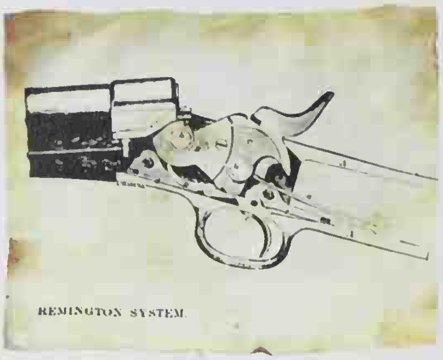
Remington Model 51 Automatic Pistol. Made circa 1918–1934. Total quantity approximately 65,000.

Caliber .32 (seven-shot) and .380 rimless (eight-shot). 3.5–inch round barrel.

Remington Model XP-100 Single Shot Pistol. Made circa 1963 to date. Bolt action.

Caliber .221 Remington Fire Ball; 10.5–inch barrel with ventilated rib; 16.75 inches overall. Weight 3.75 pounds.

Remington Rifles



Remington Model 1863 Percussion Contract Rifle, aka 'Zouave Rifle.' Made circa 1862–1865. Total quantity 12,501. Caliber .58; single shot muzzle loader; 33–inch round barrel.

Remington Single Shot Breech-Loading Carbine, aka 'Split Breech Remington.' Made circa 1864–1866.

Calibers .46 and .50 rimfire. The predecessor of the famed 'Rolling Block' design; 20–inch round barrel.

Remington-Beals Single Shot Rifle. Made circa 1866–1868. Quantity unknown; estimated at less than 800.

Remington Revolving Percussion Rifle. Made circa 1866–1879. Total quantity estimated at less than 1000.

Calibers .36 and .44; six-shot round cylinder.

Rifle Cane, aka 'Cane Gun.' Made circa 1858–1866 in percussion; made 1866 to circa 1888 in breech-loading metallic cartridge model. Total quantity estimated at 4500.

Cartridge models made in .22 rimfire and .32 rimfire. Barrel length approximately 26 inches.

Remington Rolling Block Military Rifles and Carbines. Large Number 1 size action. Made circa 1867–1902. Quantity totaling over one million.

Remington US Navy Rolling Block Carbine. Circa 1868–1869. Quantity made estimated 5000.

Caliber .50-70 center fire; 23.75–inch barrel.

Remington Number One Rolling Block Sporting Rifles, Various Types. Overall period all types circa 1868–1902.

Remington Model 1867 Navy Cadet Rolling Block Rifle. Made by Springfield Armory circa 1868 utilizing Remington actions only; the same action as the 1868–1869 Navy Carbine. Quantity made, 498.

Caliber .50-45 center fire cadet cartridge; 23.5–inch round barrel.

Remington New York State Contract Rolling Block Rifles and Carbines. Made for New York State National Guard circa 1872. Total quantity estimated at 15,000.

Rifle has 36–inch barrel.

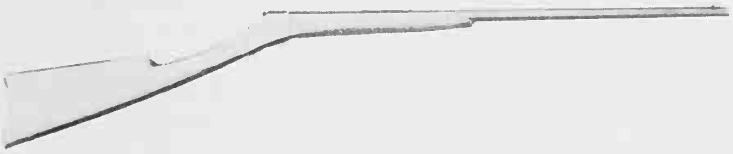
Sporting Rifle Number 1.

Calibers .40-50, .40-70, .44-77, .45-70, .50-45, .50-70; 23–inch and 30–inch octagon barrels.

These pages, column by column, from top to bottom, starting at left: **Four Rifle Canes; a cutaway of the Rolling Block action; Remington Custom shop designs commemorating the millionth Model 742 auto rifle, the two millionth Model 1100 auto shotgun and Remington's overall 10 millionth gun; a Model 742 Woodsmaster autoloading rifle; the Model 742 Woodsmaster BDL Custom Deluxe; the Model 760 Gamemaster; the Model 760 BDL Custom Deluxe; an era-spanning array of six Remington rifle and shotgun models; Model 2 Sporting Rifle; Remington-Hepburn Number 3 Creedmore; Remington-Hepburn Number 3 Sporting Model.**

Long Range 'Creedmoor' Rifle. Made circa 1873–1890. Quantity estimated as a few thousand.

Calibers .44-90, .44-100, .44-105. 34-inch part octagon/part round barrel.



Remington Model 2 Sporting Rifle. Made circa 1873–1910. Exact quantities unknown.

Large variety of rimfire calibers from .22 to .38 as well as center fire from .22 to .38-40; 24-inch and 26-inch octagon barrel standard.

Mid-Range Target Rifle. Made circa 1875–1890.

Calibers .40-70, .44-77, .45-70, .50-70; 28-inch and 30-inch part octagon/part round barrels.

Short Range Rifle. Made circa 1875–1890. Quantity estimated several thousand.

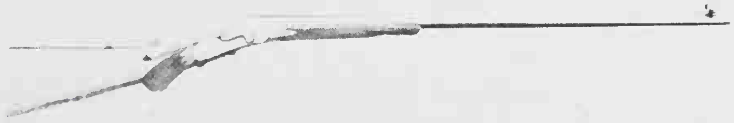
Center fire calibers .38 extra long; .40-50; .44 S&W; .44 extra long. Rimfire calibers .38 extra long; .44 extra long and .46; 26-inch and 30-inch optional octagonal or round barrels.

Black Hills Rifle. Made circa 1877–1882.

Caliber .45-60 center fire; 28-inch round barrel.

Remington-Keene Magazine Bolt Action Rifle. Made circa 1880–1888. Total quantity estimated at 5000.

Caliber .45-70 most widely made and most popular and in demand; also in .40 caliber and .43 caliber. 24.5-inch round barrel standard.



Remington-Hepburn Number 3 Improved Creedmoor. Made circa 1880–1907. Quantity unknown

Remington-Lee Magazine, Bolt Action Rifles. Made circa 1880–1907. Total quantity in excess of 100,000.

Remington-Hepburn Number 3 Long Range Military Rifle. Made circa 1880s; quantity unknown.

Chambered for .44-75-520 Remington straight cartridge; 34-inch round barrel.

Remington-Hepburn Number 3 Sporting and Target Model. Made circa 1883–1907. Quantities unknown, estimated at 8000 to 10,000.

Listed in a tremendous variety of calibers from .22 Winchester center fire to .50-90 Sharps straight. Barrel lengths 26 inches, 28 inches and 30 inches.

Remington-Hepburn Number 3 Match Rifle. Made circa 1883–1907. Quantity unknown.

Remington Model 1 1/2 Sporting Rifle. Manufactured circa 1888–1897. Estimated several thousand manufactured.

Rimfire calibers .22, .25 Stevens, .25 long, .32, .38 long and extra long. Center fire calibers .32-20, .38-40, .44-40; 24-inch to 28-inch medium weight octagon barrel.

Remington New Model Number 4 Rolling Block Rifle. Made circa 1890–1933. Quantity made estimated at over 50,000.

Chambered for rimfire calibers .22 short, long and long rifle; .25 Stevens; .32 short and long; 22.5-inch octagonal barrels for most production (24-inch also in .32 caliber) with round barrels available in latter years of production.

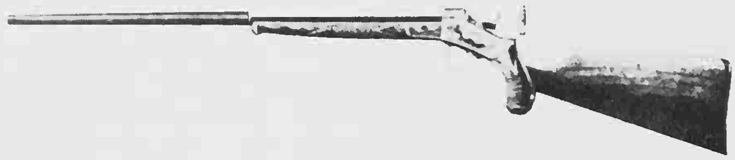
Remington Number 5 Rolling Block Rifles and Carbine. Made circa 1897–1905. Three basic styles. Total quantity estimated at 100,000.

Remington-Hepburn Number 3 High-Power Rifle. Believed introduced around 1900 and made to circa 1907. Quantity unknown.

Calibers .30-30, .30 Government, .32 Special, .32-40 HP, .38-72; 26-inch, 28-inch and 30-inch round barrels standard.

Remington Number 6 Rolling Block Type Rifle. Made circa 1902–1933. Exact quantities unknown, but over 250,000 or more.

Rimfire calibers .22 short, long, long rifle and .32 short and long; also available in smoothbore for shot cartridges; 20-inch round barrel.

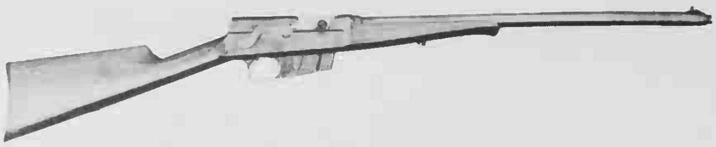


Remington Number 7 Rifle, Rolling Block Action. Made circa 1903–1911.

Rimfire calibers .22 short and long rifle, .25-10 Stevens; 24-inch, 26-inch and 28-inch part octagon/part round barrels.

Remington-Hepburn Number Schuetzen Match Rifle, aka 'Underlever Hepburn,' aka 'The Walker-Hepburn.' Made circa 1904–1907.

Calibers .32-40, .38-40, .38-50, .40-65; 30-inch or 32-inch part octagon/part round barrel.

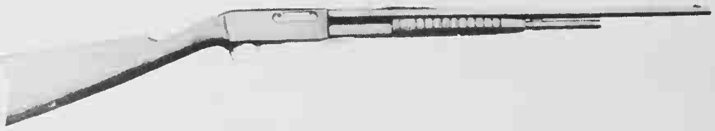


Remington Model 8A Autoloading Rifle. Made circa 1906–1936.

Calibers .25, .30, .32 and .35 Remington. Standard grade. Takedown. Detachable box magazine holds five cartridges; 22-inch barrel. Weight, 7.75 pounds.

Remington Model 12A Slide Action Repeating Rifle. Made circa 1909–1936.

Caliber .22 short, long or long rifle. Standard grade. Hammerless. Takedown. Tubular magazine holds 15 short, 12 long or 10 long rifle cartridges; 22-inch round barrel. Weight, 4.5 pounds.



Remington Model 14A High Power Slide Action Repeating Rifle. Made circa 1912–1935.

Calibers .25, .30, .32 and .35 Remington. Standard grade. Hammerless. Takedown, five-shot tubular magazine. 22-inch barrel. Weight about 6.75 pounds.

Remington Model Number 4S 'Military Model' Rolling Block Sporting Rifle, aka 'Boy Scout Rifle.' Made circa 1913–1923. Approximate quantity made estimated from 10,000 to 25,000.

Caliber .22 rimfire short and long; 28-inch round barrel.

Remington Model 16 Autoloading Rifle. Made circa 1914–1928. Closely resembles the Winchester Model 03.

Calibers .22 short, .22 long rifle, .22 Winchester rimfire, .22 Remington Automatic. Takedown, 15-shot tubular magazine in buttstock; 22-inch barrel. Weight, 5.75 pounds.

Remington Model 30A Bolt Action Express Rifle. Made from 1921–1940.

Calibers .25, .30, .32 and .35 Remington, 7mm Mauser, 30-06. Standard grade. Modified M/1917 Enfield Action. Five-shot box magazine; 22-inch barrel. Weight about 7.25 pounds.

Remington Model 24A Autoloading Rifle. Made circa 1922-1935.

Calibers: .22 short, .22 long rifle. Standard grade. Takedown. Tubular magazine in buttstock, holds 15 short or 10 long rifle; 21-inch barrel. Weight about five pounds.

Remington Model 241A 'Speedmaster' Autoloading Rifle.

Calibers .22 short, .22 long rifle. Standard grade. Takedown. Tubular magazine in buttstock, holds 15 short or 10 long rifle; 24-inch barrel. Weight about six pounds.

Remington Model 552A 'Speedmaster' Autoloading Rifle.

Caliber .22 short, long, long rifle. Tubular magazine holds 20 short, 17 long, 15 long rifle; 25-inch barrel. Weight about 5.5 pounds.

Remington Model 33 Bolt Action Single Shot Rifle. Made circa 1931–1936.

Caliber .22 short, long, long rifle. Takedown; 24-inch barrel. Weight about 4.5 pounds.

Remington Model 34 Bolt Action Repeating Rifle. Made circa 1932–1936.

Caliber .22 short, long, long rifle. Takedown. Tubular magazine holds 22 short, 17 long or 15 long rifle; 24-inch barrel. Weight about 5.25 pounds.

Remington Model 81A 'Woodmaster' Autoloading Rifle. Made circa 1936–1950.

Calibers .30, .32 and .35 Remington, .300 Savage. Standard grade. Takedown. Five-shot box magazine (not detachable); 22-inch barrel. Weight, 8.25 pounds.

Remington Model 121A 'Fieldmaster' Slide Action Repeating Rifle. Made circa 1936–1954.

Caliber .22 short, long, long rifle. Standard grade. Hammerless. Takedown. Tubular magazine holds 20 short, 15 long or 14 long rifle cartridges. 24-inch round barrel. Weight, six pounds.

Remington Model 141A 'Gamemaster' Slide Action Repeating Rifle. Made circa 1936–1950.

Calibers .30, .32 and .35 Remington. Standard grade. Hammerless. Takedown. Five-shot tubular magazine; 24-inch barrel. Weight about 7.75 pounds.

Remington Model 511A 'Scoremaster' Bolt Action Box Magazine Repeating Rifle. Made circa 1939–1962.

Caliber .22 short, long, long rifle. Six-shot detachable box magazine. Takedown; 25-inch barrel. Weight about 5.5 pounds.

Remington Model 550A Autoloading Rifle. Made circa 1941–1971.

Has 'Power Piston' or floating chamber which permits interchangeable use of .22 short, long or long rifle cartridges. Tubular magazine holds 22 short, 17 long, 15 long rifle; 24-inch barrel. Weight about 6.25 pounds.

Remington Model 521 TL Junior Target Bolt Action Repeating Rifle. Made circa 1947–1969.

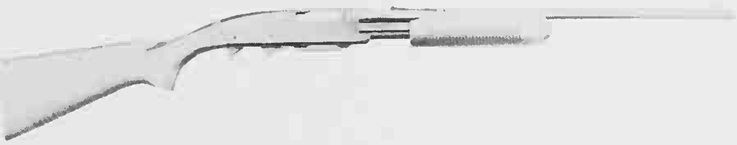
Caliber, .22 long rifle. Takedown. Six-shot detachable box magazine; 25-inch barrel. Weight about seven pounds.

Remington Model 721A Standard Grade Bolt Action High Power Rifle. Made circa 1948–1962.

Calibers: .264 Winchester, .270 Winchester, .30-06. Four-shot box magazine; 24-inch barrel. Weight about 7.25 pounds.

Remington Model 722A Standard Grade Bolt Action Sporting Rifle. Made circa 1948–1962. Same as Model 721A, except shorter action.

Calibers .257 Roberts, .308 Winchester, .300 Savage. Weight, seven pounds.



Remington Model 760 'Gamemaster' Standard Grade Slide Action Repeating Rifle. Made circa 1952–date.

Calibers .223 Remington, 6mm Remington, .243 Winchester, .257 Roberts, .270 Winchester, .280 Remington, .30-06, .300 Savage, .308 Winchester, .35 Remington. Hammerless; 22-inch barrel. Weight about 7.5 pounds.

Remington Model 572A 'Fieldmaster' Slide Action Repeater. Made circa 1955–date.

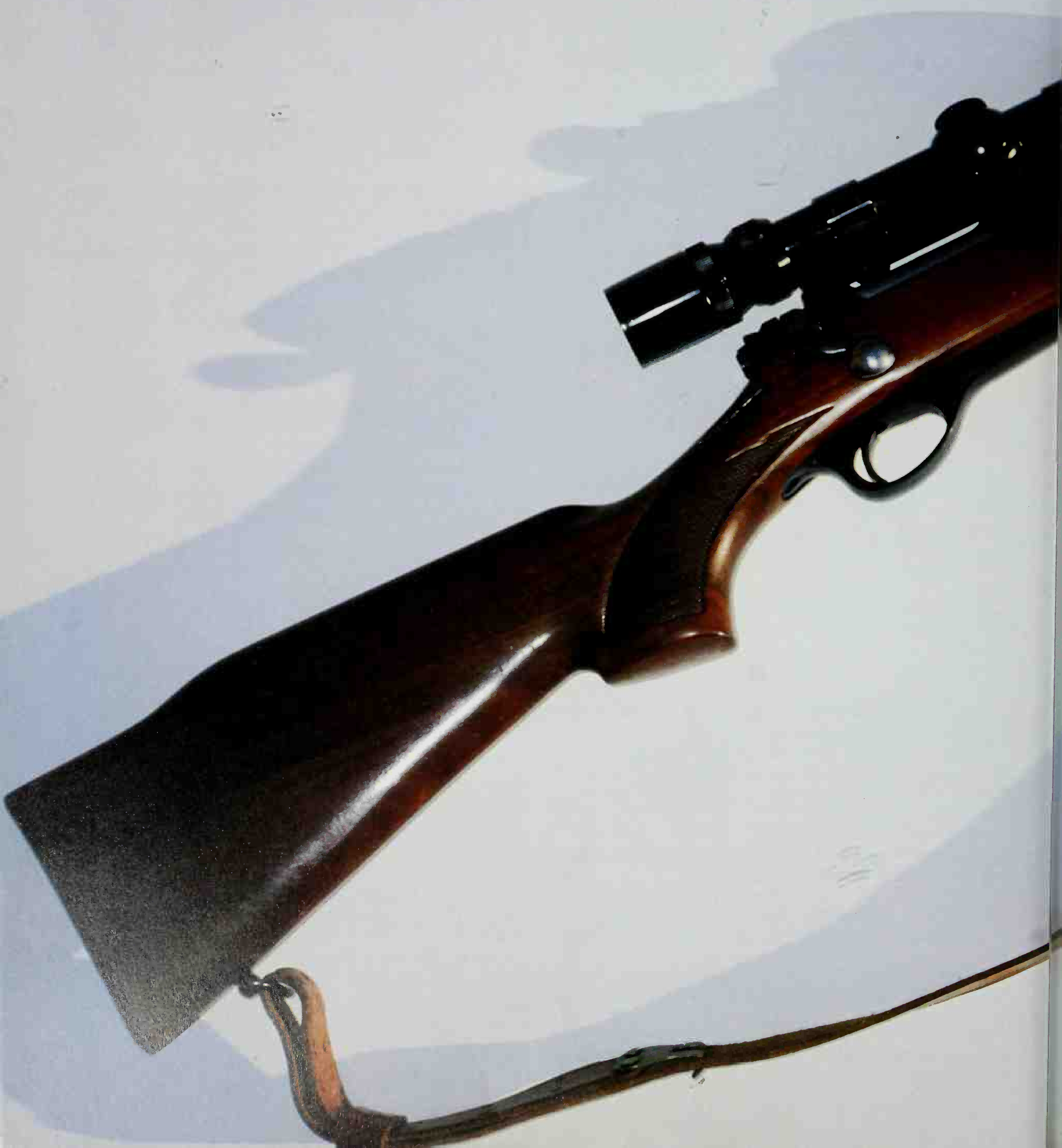
Caliber, .22 short, long, long rifle. Hammerless. Tubular magazine holds 20 short, 17 long, 15 long rifle; 23-inch barrel. Weight about 5.5 pounds.

Remington Model 40X Heavyweight Bolt Action Target Rifle. Made circa 1955–1964. Action similar to Model 722.

Caliber .22 long rifle. Single Shot. Click adjustable trigger; 28-inch heavy barrel. Weight, 12.75 pounds.

Top to bottom, starting with the extreme left column: **A New Model Number 4; a Number 5; a Number 7; a Model 8A auto; a Model 14A pump; a Model 4S Boy Scout Rifle; a Model 24A auto; a Model 33 bolt action; a Model 34 bolt action; a Model 141 pump; a Model 760; a Model 760 Deluxe; and a Model 40X.**

These pages: A Model 600 Mohawk bolt action carbine in .243 Winchester caliber, with telescopic sight and sling. The stock of this excellent firearm has been customized by its owner, Mr Don Griffith. With a five-shot magazine and weighing 6.5 pounds, this firearm was manufactured from 1963—1971, and many of these fine firearms are still in circulation.



ci-
he
He
as
rs.
By
nt
ng

a-
le
es
e-
c-
rt
ie

st
s-
s
s
y
g
y
-
s
d

Remington Nylon 66 'Mohawk Brown' Autoloading Rifle. Made circa 1959–date.

Caliber .22 long rifle. Tubular magazine in buttstock holds 14 rounds. 19.5–inch barrel. Weight about four pounds.

Remington Model 742 'Woodmaster' Automatic Big Game Rifle. Made circa 1960–date.

Calibers 6mm Remington, .243 Winchester, .280 Remington, .30-06, .308 Winchester. Gas-operated semiautomatic. Four-shot clip magazine; 22–inch barrel. Weight, 7.5 pounds.

Remington Nylon 76 Lever Action Repeating Rifle Made circa 1962–1964. Other specifications same as for Nylon 66.

Short-throw lever action.

Remington Model 700ADL Center Fire Bolt Action Rifle. Made circa 1962–date.

Calibers .22-250, .222 Remington, .25-06, 6mm Remington, .243 Winchester, .270 Winchester, .30-06, .308 Winchester, 7mm Remington Magnum. Magazine capacity: six-shot in .222 Remington, four-shot in 7mm Remington Magnum, five-shot in other calibers. Barrel lengths 24–inch in .22-250, .222 Remington, .25-06, 7mm Remington; 22–inch in other calibers. Weight, seven pounds.

Remington Model 660 Bolt Action Carbine. Made circa 1963–1971.

Calibers .222 Remington, 6mm Remington, .243 Winchester, .308 Winchester. Five-shot box magazine (six-shot in .222); 20–inch barrel. Weight, 6.5 pounds.

Remington Model 600 Bolt Action Carbine. Made circa 1964–1967.

Calibers .222 Remington, 6mm Remington, .243 Winchester, .308 Winchester, .35 Remington five-shot box magazine (six shot in .222 Remington); 18.5–inch barrel with ventilated rib. Weight, six pounds.

Remington Model 40-XB Center Fire Match Rifle. Made circa 1964–date.

Calibers: .222 Remington, .222 Remington Magnum, .223 Remington, .22-250, 6x47mm, 6mm Remington, .243 Winchester, .25-06, 7mm Remington Magnum, .30-06, .308 Winchester (7.62mm NATO), .30-388, .300 Winchester Magnum. Bolt Action single shot; 27.25–inch standard or heavy barrel. Weight, 9.25 pounds heavy barrel.

Remington Model 788 Center Fire Bolt Action Rifle. Made circa 1967–date.

Calibers .222 Remington, .22-250, .223 Remington, 6mm Remington, .243 Winchester, .308 Winchester, .30-30, .44 Remington Magnum. Three-shot clip magazine (four-shot in .222 and .223 Remington); 24–inch barrel in .22s, 22–inch in other calibers. Weights 7.5 pounds with 24–inch barrel, 7.25 pounds with 22–inch barrel.

Remington Model 580 Bolt Action Single Shot Made circa 1967–date.

Caliber .22 short, long, long rifle; 24–inch barrel. Weight, 4.75 pounds.

Remington Model 541-S Custom Sporter Made circa 1972–date.

Caliber .22 short, long, long rifle. Bolt action repeater. Scroll engraving on receiver and trigger guard. Five-shot clip magazine; 24–inch barrel. Weight, 1.5 pounds.

Remington Nylon 66 Bicentennial Commemorative. Made in 1976. Same as Nylon 66, except has commemorative inscription on receiver, celebrating the 200th anniversary of American independence.

Above: A Model 742. *Below, from top to bottom:* The Model 74 Sportsman autoloader; the Model 76 Sportsman pump action rifle; and the Sportsman 581 bolt action rifle. With a variety of target and hunting sights available, these are versatile firearms.

Remington Shotguns

Remington-Whitmore Model 1874 Double Barrel Hammer Shotgun and Rifle. Made circa 1874–1882. Total quantity estimated at a few thousand.

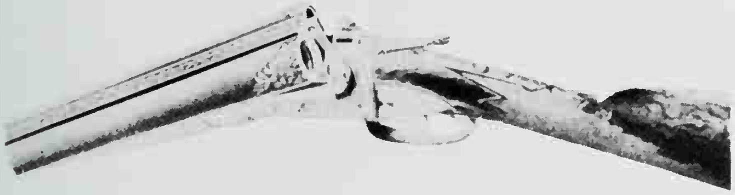
Barrels 28–inch and 30–inch, steel standard.

Model 1882 Double Barrel Hammer Shotgun. Made circa 1882–1889. Total quantity estimated at approximately 7500.

Gauges 10 and 12; 28–inch and 30–inch steel or damascus barrels.

Model 1885, Model 1887, Model 1889 Double Barrel Hammer Shotguns. Made circa 1885–1909. Total quantity unknown, estimated over 30,000.

Gauges 10, 12, 16; barrel lengths 28 inches to 32 inches; available in steel or damascus barrels.



Hammerless Shotguns Model 1894 and Model 1900. Made circa 1894–1910. Total produced unknown.

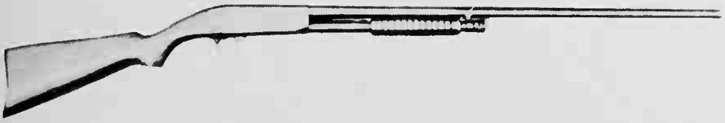
Gauges 10, 12, 16; barrel lengths from 26 inches to 32 inches, steel or damascus twist.

Remington Model 11A Standard Grade 5-Shot Autoloader. Made circa 1905–1949.

Gauges 12,16 and 20. Hammerless Browning type. Takedown. Tubular magazine holds four shells. Plain, solid rib or ventilated rib barrels; lengths from 26 inches to 32 inches.

Remington Model 10A Standard Grade Slide Action Repeating Shotgun. Made circa 1907–1929.

Gauge, 12. Hammerless. Takedown; six-shot. Five-shell tubular magazine. Plain barrels, 26 inches to 32 inches.

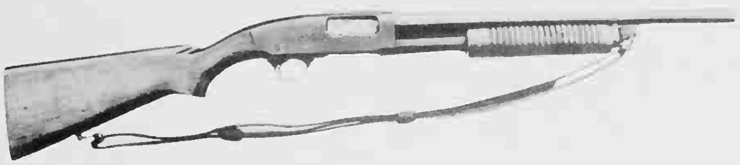


Remington Model 17A Standard Grade Slide Action Repeating Shotgun. Made circa 1921–1933.

Gauge, 12. Hammerless. Takedown. Five-shot. Four-shell tubular magazine. Plain barrels, 26 inches to 32 inches; full, modified or cylinder bore chokes. Weight about 5.75 pounds.

Remington Model 29A Standard Grade Slide Action Repeating Shotgun. Made circa 1929–1933.

Gauge, 12. Hammerless. Takedown. Six-shot. Five-shell tubular magazine. Plain barrels, 26 inches to 32 inches; full, modified or cylinder bore chokes. Weight about 7.5 pounds.



Remington Model 31A Standard Grade Slide Action Repeater.

Gauges 12, 16 and 20. Hammerless. Takedown. Three-shot or five-shot. Tubular magazine holds two or four shells. Plain or ventilated rib barrels; lengths from 26 inches to 32 inches.

Remington Model 32A Standard Grade Over-and-Under Gun. Made circa 1932–1942.

Guage, 12. Hammerless. Takedown. Automatic ejectors. Plain, raised matted solid rib, ventilated rib barrels; 26 inches, 28 inches, 30 inches, 32 inches. Weight about 7.75 pounds.

Remington Sportsman-48A Standard Grade 3-Shot Autoloader. Made circa 1949–1959.

Gauges 12, 16 and 20. Streamlined receiver. Hammerless. Takedown.

Remington Wingmaster Model 870AP Standard Grade 5-Shot Slide Action Repeater. Made circa 1950–1963.

Gauges 12, 16 and 20. Hammerless. Takedown. Tubular magazine holds four shells. Plain, matted top surface or ventilated rib barrels; 26-inch improved cylinder, 28-inch modified or full choke, 30-inch full choke (12 gauge only). Weight about seven pounds.

Remington Sportsman-58ADL Autoloader. Made circa 1956–1964.

Gauge, 12. Deluxe grade. Gas-operated; three-shot magazine. Plain or ventilated rib barrels; 26 inches, 28 inches, 30 inches. Weight about seven pounds.

Remington Model 1100 Automatic Field Gun. Made circa 1963–date.

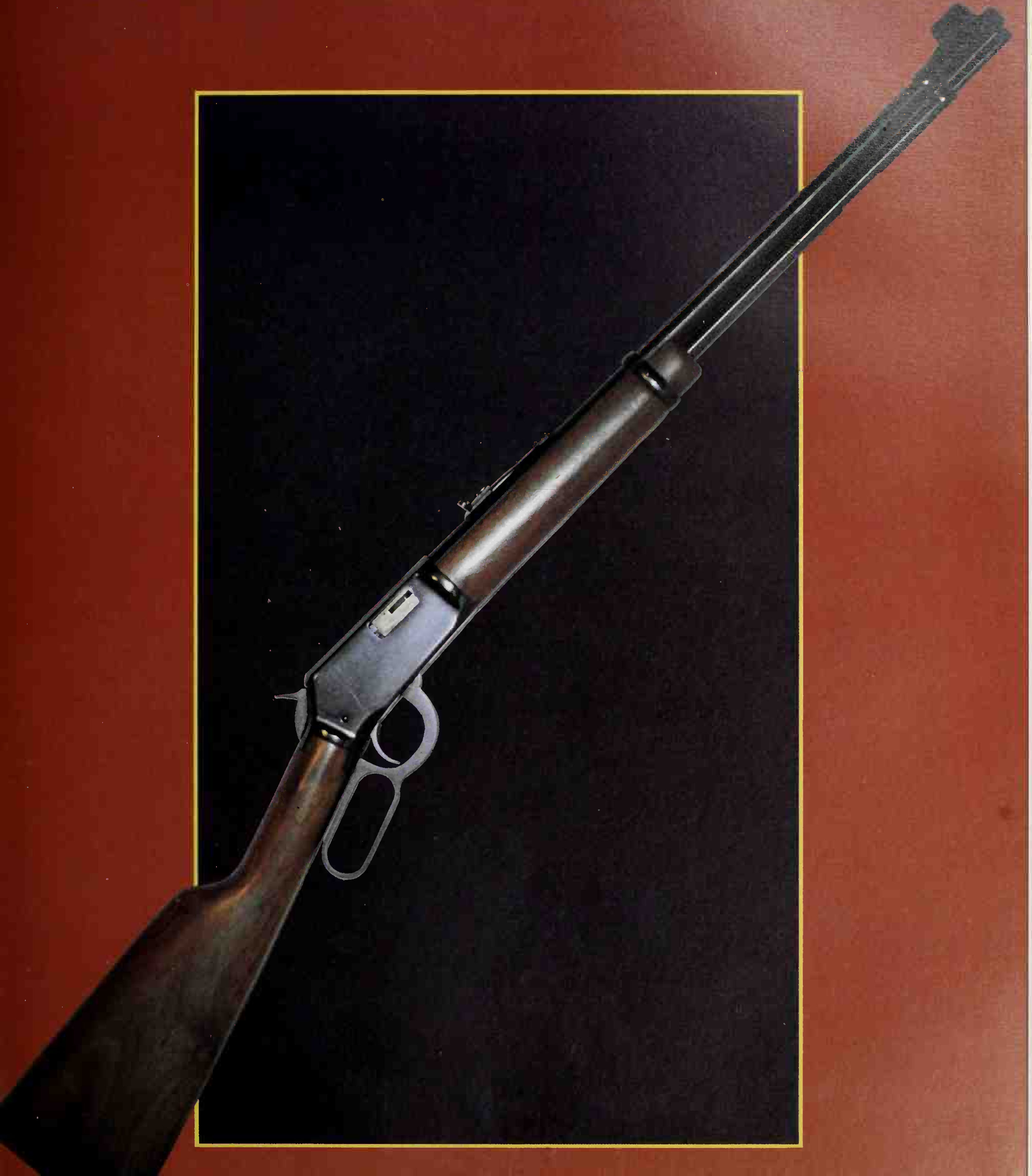
Gauges 12, 16 and 20. Gas-operated. Hammerless. Takedown. Plain or ventilated rib barrels; 30-inch/full, 28-inch/modified or full, 26-inch/improved cylinder. Weights average 7.25 to 7.5 pounds.

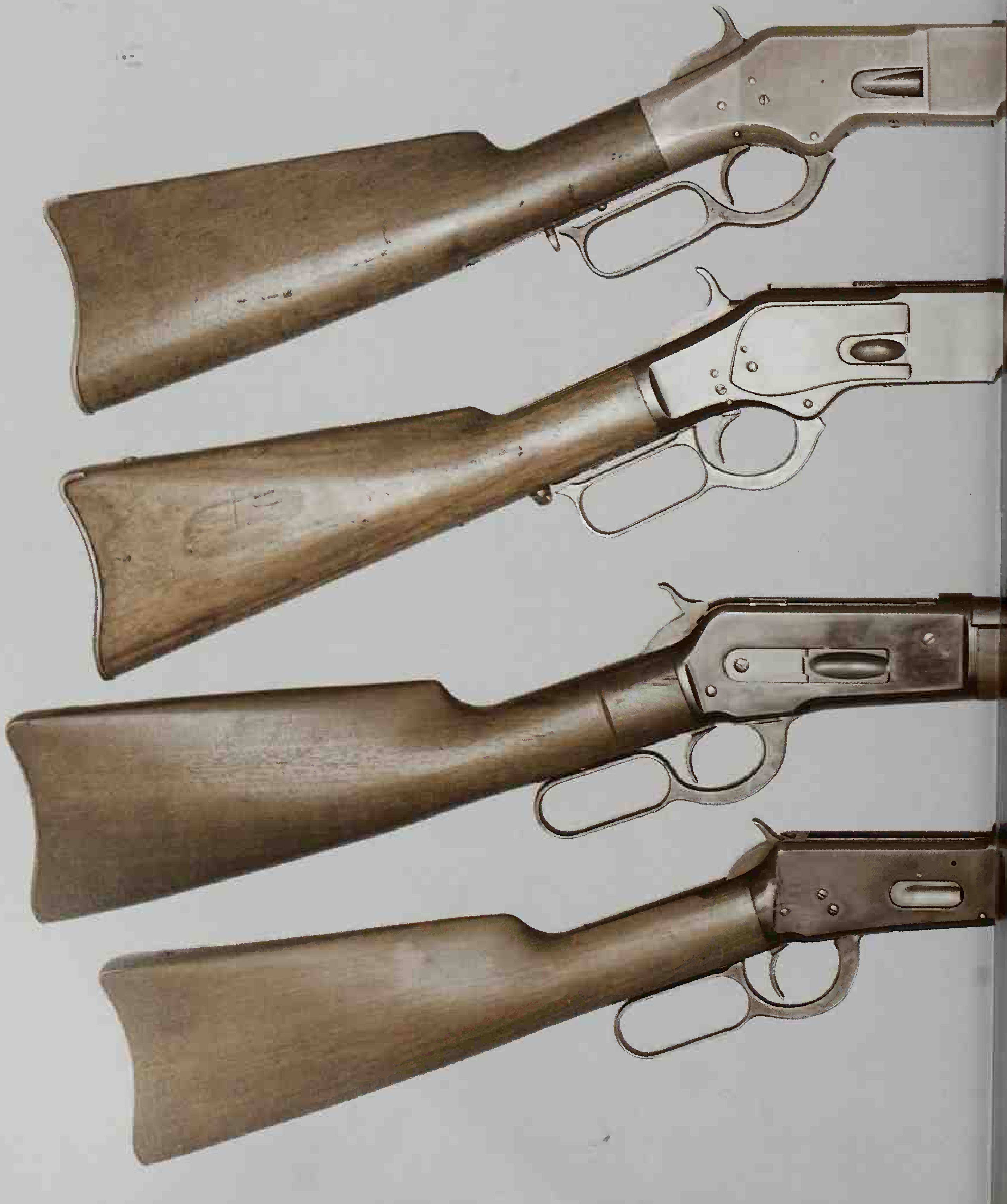
Remington Model 3200 Field Grade Over-and-Under Shotgun. Made circa 1973–date.

Gauge, 12. Box lock. Automatic ejectors. Selective single trigger. 2.75–inch chambers. Ventilated rib barrels: 26-inch improved cylinder and modified; 28-inch, modified and full, 30-inch modified and full choke. Weight about 7.75 pounds.

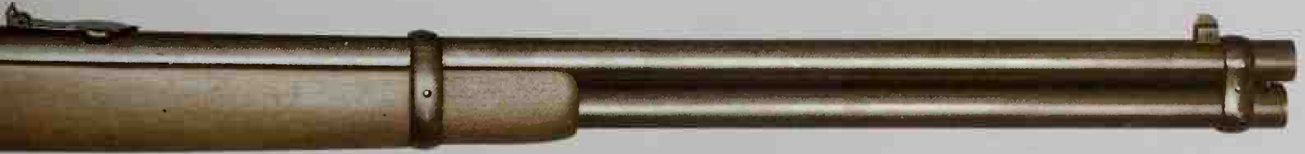
***Top to bottom, left to right:* The super fine Remington Special Model 1900, one of the finest doubles ever produced; the Model 17A Standard pump; the Model 31A Standard; and the Sportsman-48A Standard-Grade Autoloader.**

America's Premier Gunmakers
WINCHESTER





Previous pages: Inheritor of the proud Model 94 lever action tradition, this Model 9422M is a handy varmint rifle in .22 Magnum caliber. *These pages, from top to bottom:* A Model 66 Winchester, the model to bear the Winchester Repeating Arms Company name; a Model 73, of the type that Buffalo Bill Cody called 'the Boss'; a Model 86, with greatly improved lever action mechanism; and a Model 94—one of the most popular hunting rifles ever manufactured.



Oliver F

Oliver F Winchester was born in Boston in 1810. His impoverished youth was followed by an apprenticeship with a carpenter. By age 21, he became a master builder, but the world of business lured him to Baltimore where he operated a men's clothing store. In 1848, the now successful Winchester settled in New Haven, Connecticut and established the nation's first shirt factory. This venture made him wealthy and a leading citizen of 'The Elm City,' but he still searched for further opportunities.

Winchester first invested his talent and money in the gun business in 1855, when he became one of the original stockholders of the Volcanic Repeating Arms Company. This company had been formed in Norwich, Connecticut with the goal of developing and marketing a repeating rifle, an item that had long been a gleam in the eye of many inventors. The business failed in February of 1857, despite several cash advances by Winchester totaling over $25,000; however, he did manage to take over all the major claims against the company and bought out the other investors. In April of that year, the company was reorganized as the New Haven Arms Company with Winchester as President and Treasurer.

The company continued production of the Volcanic Arms models and ammunitions but soon hired Benjamin Henry, a wizard gunmaker, to turn the old, rather weak Volcanic lever action and its ammunition into a new, more viable, weapons system. In only three years, Henry's Rifle was ready to be sold. He had not only come close to perfecting the metallic rimfire cartridge, but had given the New Haven Arms Company ammunition that was considerably more potent than their old Volcanic Arms self-contained cartridge-bullets. The new Henry cartridge of .44 caliber propelled a 216 grain bullet at 1200 feet per second. Henry's work ranks as one of the most important developments in firearms history—his repeating rifle was the first truly practical magazine fed, breechloading, repeating firearm.

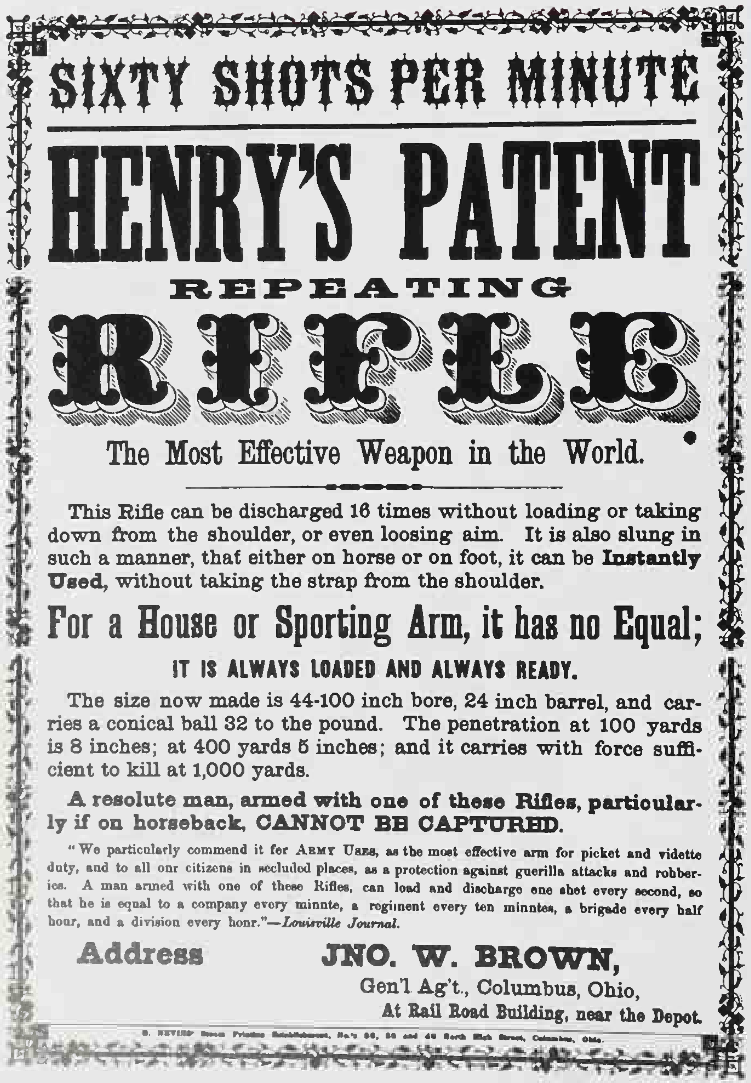
The Henry Rifle, however, was rejected by the US Army, who preferred the old-fashioned single shot rifle to anything that even hinted of innovation. It took the Civil War to prove once and for all the superiority of the New Haven Arms Company's Henry repeater. Though rejected as armament for federal troops, militias from Connecticut and other states armed themselves with the new lever actions. The demand for ammunition was so great that the US Army, which did eventually purchase 1200 of the rifles, had to buy five million rounds from the company for its volunteer regiments.

By the end of the Civil War, the company's net worth amounted to $354,000, and in February of 1867, its name was changed to the Winchester Repeating Arms Company. The deep recession following the Civil War nearly doomed the enterprise, but a timely order from the Mexican rebel Juarez, as well as various Turkish sultans, supplied sufficient business to ensure the company's continued existence.

Winchester Repeating Arms was housed in a brick building of four floors located at 9 Artizan Street in New Haven and employed 100 workers. The standard workweek at Winchester during this period was from seven o'clock in the morning to six o'clock in the evening (with an hour for lunch Monday through Friday), and Saturday from seven o'clock in the morning to five o'clock in the evening. Only those

Manufactured by the New Haven Arms Company under the direction of Oliver F Winchester, the Henry Repeating Rifle *(above)* was the first practical magazine fed, breechloading, repeating firearm. *At right:* The Volcanic Repeating Arms Company offices in New Haven, Connecticut.

Winchester's Company



SIXTY SHOTS PER MINUTE

HENRY'S PATENT

REPEATING

RIFLE.

The Most Effective Weapon in the World.

This Rifle can be discharged 16 times without loading or taking down from the shoulder, or even loosing aim. It is also slung in such a manner, that either on horse or on foot, it can be **Instantly Used**, without taking the strap from the shoulder.

For a House or Sporting Arm, it has no Equal;

IT IS ALWAYS LOADED AND ALWAYS READY.

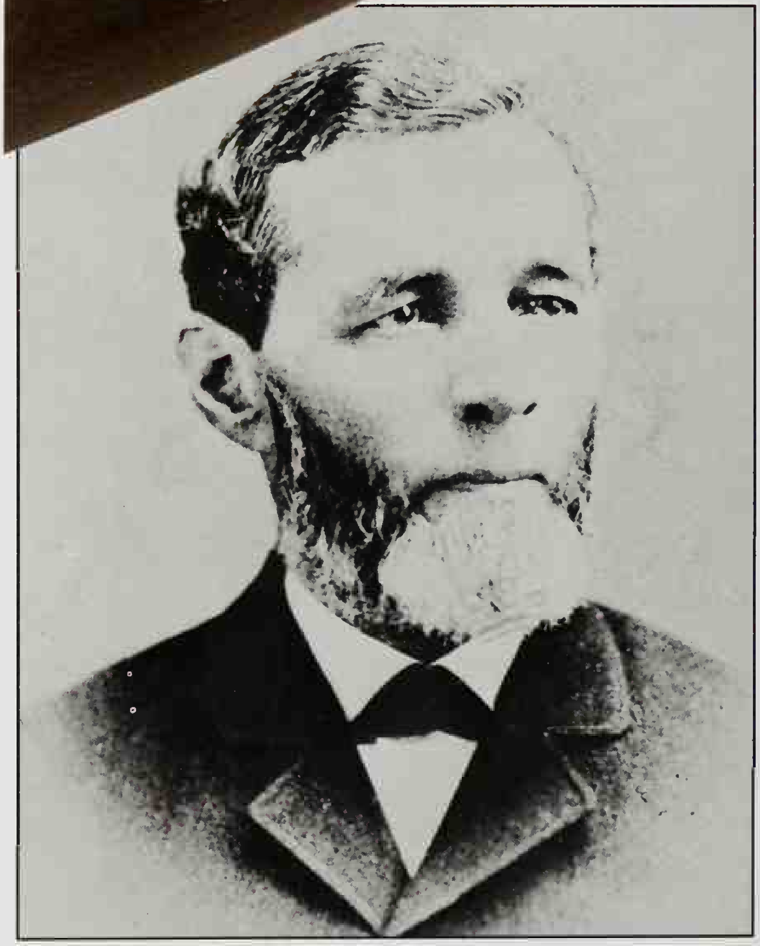
The size now made is 44-100 inch bore, 24 inch barrel, and carries a conical ball 32 to the pound. The penetration at 100 yards is 8 inches; at 400 yards 5 inches; and it carries with force sufficient to kill at 1,000 yards.

A resolute man, armed with one of these Rifles, particularly if on horseback, CANNOT BE CAPTURED.

"We particularly commend it for ARMY USES, as the most effective arm for picket and vidette duty, and to all our citizens in secluded places, as a protection against guerilla attacks and robberies. A man armed with one of these Rifles, can load and discharge one shot every second, so that he is equal to a company every minute, a regiment every ten minutes, a brigade every half hour, and a division every hour."—*Louisville Journal.*

Address **JNO. W. BROWN,**
Gen'l Ag't., Columbus, Ohio,
At Rail Road Building, near the Depot.

S. NEVINS' Steam Printing Establishment, No's 36, 38 and 40 North High Street, Columbus, Ohio.

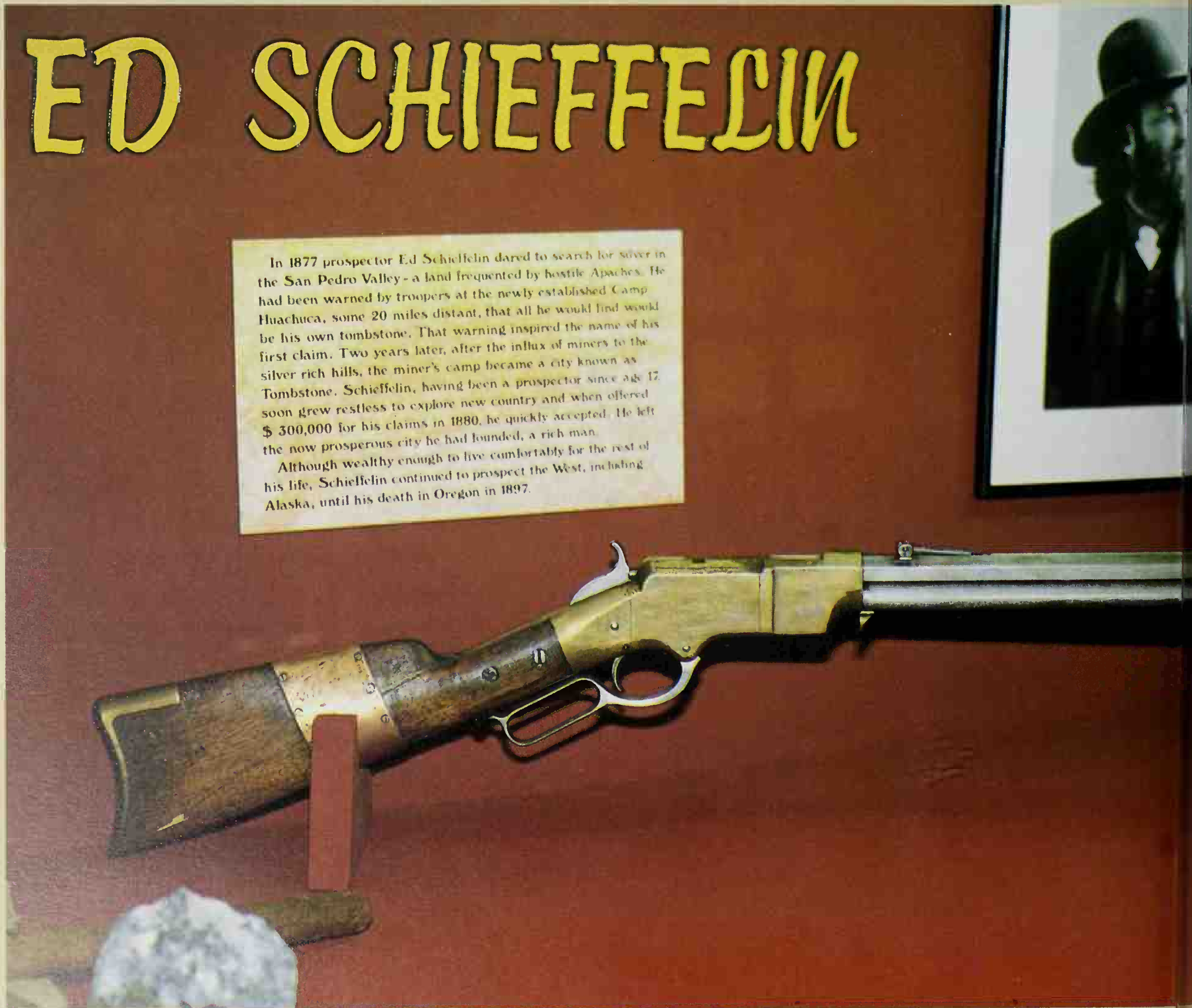


At left: **Benjamin Henry, creator of the famed Henry Repeating Rifle, at about the time of the Civil War.** ***Far left:*** **An advertisement for the Henry Repeating Rifle. These classic firearms** ***(above, top to bottom)*****—two rifles and a carbine—were manufactured by the Volcanic Repeating Arms Company, the forerunner of the New Haven Arms Company.**

employees who had perfect attendance with no tardiness received the full 60 hours pay, and not surprisingly most of the work force lived within easy walking distance of the 'Winchester Works.'

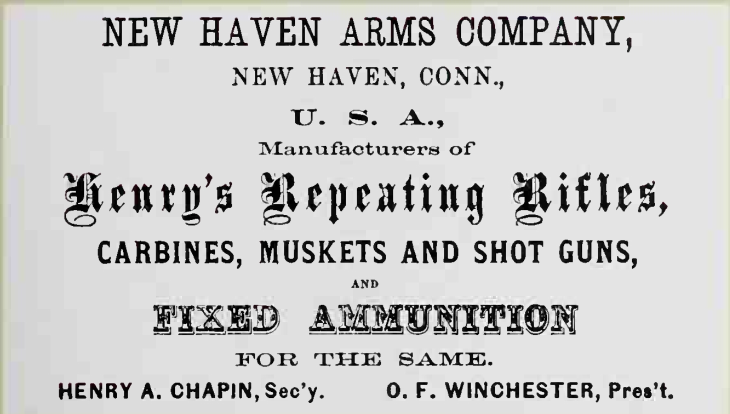
In 1872, a new plant was completed at the corner of Munson and Canal streets (Canal Street would later be renamed Winchester Avenue). These buildings were along the west side of the street, where the Olin 'B' Track parking lot is today located. Most of the original buildings have been torn down in recent years. Of the still-existing buildings, 5-F—built in 1883—and the Custom Shop buildings (6-B)—built in 1887—are the oldest. In 1866, the first gun to bear the name of Winchester—the Model 1866 or, as it was known then, the 'New Model Winchester'—appeared. The '66' was an improved Henry rifle with the addition of a loading port on the side of the receiver and a wood forearm. These two improvements made the difference between a good gun and a true classic.

In 1873 (the first time that the actual year of introduction was used as a Winchester model designation), the Model 1873 Rifle and the world's first center fire metallic cartridge, the .44-40 Winchester, were introduced. The Model 1873 was manufactured from 1873 until 1924, with total production of 720,000 pieces. The largest production year was 1891, when over 41,000 Model 73s were manufactured. Designated 'The Boss' by Buffalo Bill Cody, this was the gun, more than any other, that became legendary. Even more important to the company than the Model 73 itself was that Winchester had entered the general metallic-cased ammunition business. Prior to 1873, Winchester had produced ammunition to fit its own rifles and pistols only.Oliver Winchester's genius lay in being able to organize, manufacture and set up distributing systems that successfully produced and marketed his rifles. He had continually enlarged the company's armory facilities and brought in new and improved machinery. His introduction of new, mass production methods and his relentless emphasis on research had made his firm one of the earliest to profit from the benefits of modern industrial technology. While wages of workers had risen from $1.50 a day to $3.50, Winchester's production costs actually fell. Rifle barrels, for example, went from $800 per hundred to a cost of just under $80 for the same number.The industrial revolution was an era when industrialists, merchants and inventors of every description were hard at work pushing the United States into the forefront of world commerce. Oliver Winchester was a member of this elite group and like his contemporaries he was also not one to shrink from his civic duties, serving as a councilman for the city of New Haven during the Civil War, becoming Lieutenant Governor of the state of Connecticut and in 1878 being instrumental in the formation of the Board of Associated Charities, a forerunner of today's United Fund. On 10 December 1880, Oliver F Winchester died and his son's brother-in-law, William W Converse, was elected to succeed him as President of the firm.



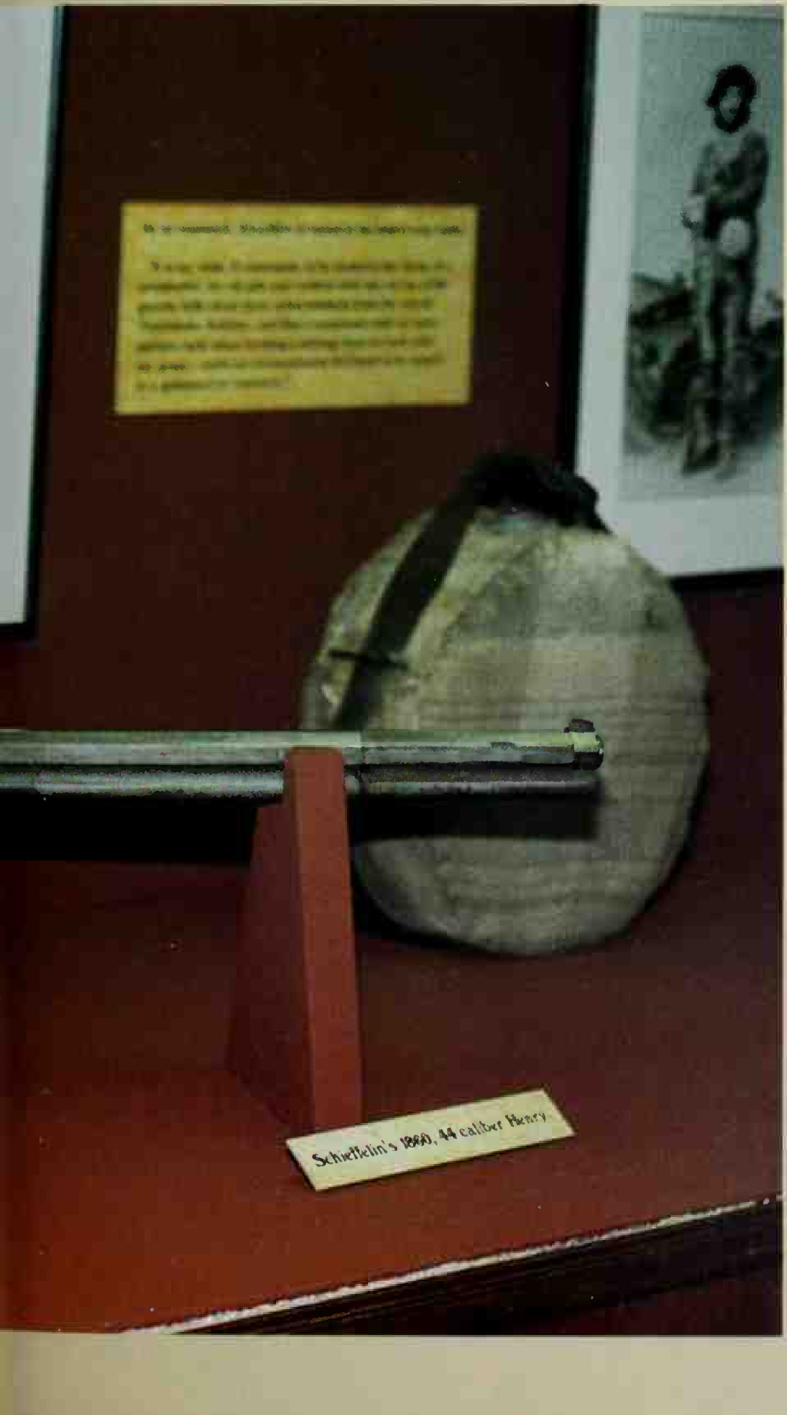
In 1877 prospector Ed Schieffelin dared to search for silver in the San Pedro Valley - a land frequented by hostile Apaches. He had been warned by troopers at the newly established Camp Huachuca, some 20 miles distant, that all he would find would be his own tombstone. That warning inspired the name of his first claim. Two years later, after the influx of miners to the silver rich hills, the miner's camp became a city known as Tombstone. Schieffelin, having been a prospector since age 17, soon grew restless to explore new country and when offered $ 300,000 for his claims in 1880, he quickly accepted. He left the now prosperous city he had founded, a rich man.

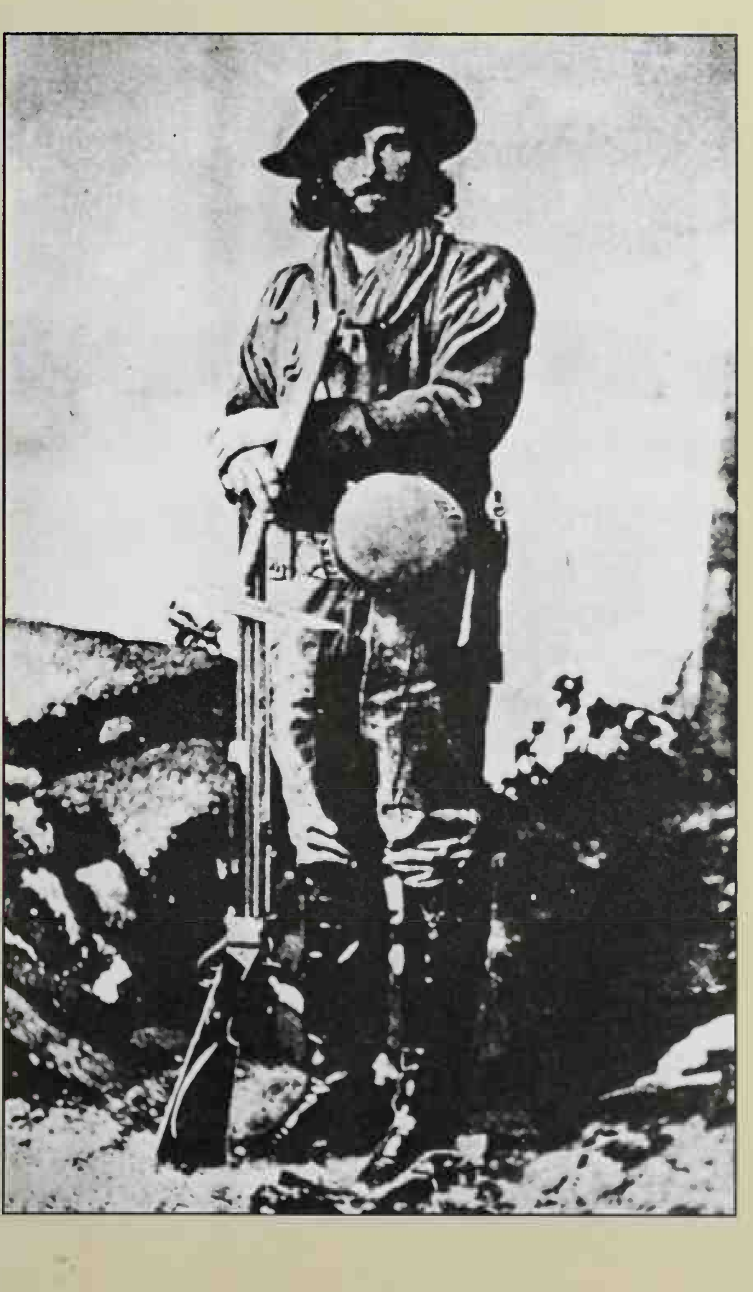
Although wealthy enough to live comfortably for the rest of his life, Schieffelin continued to prospect the West, including Alaska, until his death in Oregon in 1897.



NEW HAVEN ARMS COMPANY,
NEW HAVEN, CONN.,
U. S. A.,
Manufacturers of
Henry's Repeating Rifles,
CARBINES, MUSKETS AND SHOT GUNS,
AND
FIXED AMMUNITION
FOR THE SAME.
HENRY A. CHAPIN, Sec'y. O. F. WINCHESTER, Pres't.

At right: The trade card for the New Haven Arms Company, the manufacturer of the Henry Repeating Rifle. *Below left:* An exhibit at the Tombstone Courthouse State Historic Park honoring Ed Schiefflin (below), the prospector who discovered the Lucky Cuss Mine that started the rush to Tombstone, Arizona. Schiefflin always carried a Henry Repeating Rifle in his travels. *At top:* The Winchester Model 66 was an improved version of the Henry Repeating Rifle. The addition of a loading port on the side of the receiver and a wood forearm made a good gun a true classic.





Winchester and Browning

In 1885, through the hard work and bargaining skills of Thomas G Bennett, who had recently become President of Winchester, a long and profitable agreement between the company and John Moses Browning began. One of Bennett's trips to Browning's headquarters in Ogden, Utah netted the designs for the 1885 Single Shot Rifle and the 1886 Lever Action Rifle for only $8000. These rifles were the first Winchesters adapted to the very long range shooting prevalent in the western United States.

In the ensuing years, Browning sold Winchester over 40 gun designs outright, of which seven rifles and three shotguns were actually manufactured and became the mainstays of the Winchester product line. By the turn of the century, Browning had perfected automatic firearm designs, including his truly groundbreaking automatic (actually, semiautomatic) shotgun.

It was over the issue of Thomas G Bennett's extraordinarily cautious approach to the automatic shotgun design that Winchester lost its special relationship with John Moses Browning. Further difficulty arose from the fact that Browning's designs had previously been sold to Winchester on a fee simple basis that did not include the payment of royalties. With the advent of this new design, Browning expressed a desire to receive royalties for it and other designs to follow. While this was no doubt an exacerbating factor in the deterioration of the Winchester-Browning relationship, it can be seen by the following narrative that it was not the primary difficulty by any stretch of the imagination. Browning's break with Winchester was well publicized, and in later years Browning recalled the circumstances as follows:

'It was not a very dignified parting, I admit, but I was younger then. Bennett was the most conservative of men, and admittedly the automatic was something of an inno-

vation. To put it simply, he was afraid of it, and so were the few men in his confidence. They were afraid that it would take ten years to develop such a gun to the point where it would be a profitable manufacturing article. It doesn't take many weak spots to eat up all the profit.

'Don't think of him as a coward. He enlisted at 16 and fought through the Civil War, coming out a captain. Cowards don't do things like that. But he didn't replace the old 73 and 76 models until competition forced him to it. The 86 pulled him out of that hole. Winchester had a fine record. It was their boast at one time that the company had not borrowed a cent for 40 years. The factory was a temple, and Bennett was the high priest.

'He never had an official of the company present at any of our confabs. His conservativeness worked pretty well. He is a big man, and he looked so solid in his chair that I had the feeling I could come back year after year, find him there, make a deal without any wasted words, and get back to work. It was a comfortable feeling...

'The automatic shotgun put Bennett in a tough position. I'll bet he'd have shelled out a hundred thousand dollars just to have had it banished forever from the earth, leaving him with his levers and pumps. If he made the gun and it proved a failure, as he and his advisors seemed to have half suspected, it would leave a blot on the Winchester name. Even if he made it and it proved a big success, it would seriously hurt one of the best-paying arms in his line—the 97 shotgun. If a competitor got it, and it caught the popular fancy, he'd be left a long jump behind in an important branch of the business. That's why he marked time for two years, and why, once I'd forced a showdown, I got so mad.'

Far left:* John M Browning designed numerous firearms for Winchester. Browning and Thomas G Bennett, president of Winchester, *(right)* ended the relationship following a dispute over the design of Browning's revolutionary automatic shotgun *(below).

Winchester Smokeless

The decade of the 1880s was a period of great growth in the ammunition business, increasing fivefold while the business climate in general remained stable. Winchester became one of the largest ammunition manufacturers in the world during this period. In 1888 Winchester, in partnership with the Union Metallic Cartridge Company and Marcellus Hartley, bought out the Remington Arms Company of Ilion, New York, but this arrangement was short lived and was officially dissolved in 1896, when all of Winchester's interest was sold to Mr Hartley; the Sherman Anti-Trust Law was chiefly to blame. Still, by 1890 Winchester was the pre-eminent arms and ammunition manufacturer in the United States.

That was an era in which new developments in firearms designs were beginning to grow out of new developments in the type of gunpowder used in cartridges. The old 'black' powder had served for hundreds of years, but was prone to cause any rifle, pistol or shotgun to belch huge clouds of sulfurous smoke with each shot. It could be said that a new era in firearms design arrived when the old black powder formula was incrementally improved upon—by way of a phenomenal chain of developments that resulted in the invention of modern, relatively clean-burning and more efficient 'smokeless' powder.

Black powder had been known for centuries in China before it was introduced into the Western world and put to use in warfare. It is a matter of conjecture who was the first European to discover that a combination of charcoal, sulphur and saltpeter would burn violently enough to propel a projectile. In any event, since its first use in firearms around the middle of the fourteenth century, black powder continued to be made of these ingredients. The charcoal produces gas volume, sulphur the temperature, and saltpeter the oxygen to facilitate fast burning. At first, little care was taken for the quality of the gunpowder—if it worked, it worked, that was all.

Over the years, the importance of using pure ingredients was recognized, and a moderate control over the relative power of each charge was achieved by varying the grain size. Still, the tried and true combination of 75 parts saltpeter, 10 parts sulphur and 15 parts charcoal remained the basic formula for gunpowder.

The lethality of the first weapons using black powder were less important against an enemy than the unnerving effect of the flame and smoke they produced. Gradually, firearms were improved and their superiority was eventually established over the battle-axe, the sword, the spear, the longbow and the crossbow—and the art of war was revolutionized.

Then came the nineteenth century, during which the increase in the efficiency of firearms—especially the rifle—had been rapid.

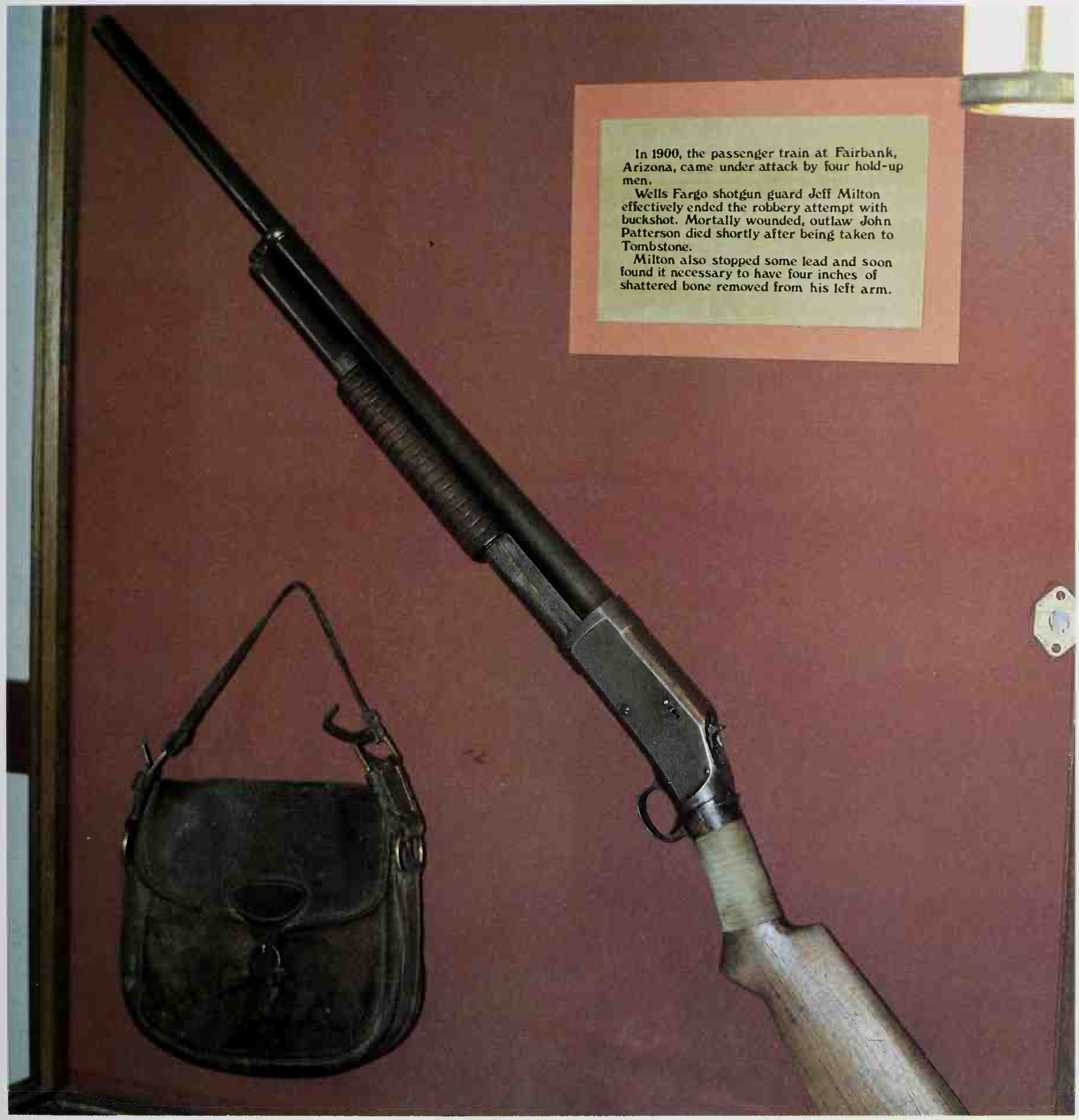
By 1890, however, technical developments both in guns and ammunition had just about reached the limits imposed by the use of black powder. Little more could be done to improve the equilibrium of weight, barrel length and rifling twist of firearms using this type of propellant. To obtain greater velocities and flatter trajectories with the same calibers and weights of bullets, the powder loads and cartridge cases had been lengthened to the extent that such powerful black powder cartridges as the Sharps .40-90 and the Winchester .40-110-260 Express measured nearly four inches long.

These dimensions made their use in repeating arms very problematic, and even the single shot weapons capable of handling them were about as large and heavy as could be made and still be used as a shoulder arm.

The principal limitations of black powder as a propellant are its incomplete combustion which lessens its efficiency (and hence, its potential power-to-volume ratio) and fouls the barrel of a firearm, the heavy smoke it gives off when fired which not only stinks but also reveals the position of the shooter to an enemy or game, and the fast rate at which it burns after ignition—which would prove to provide a far less powerful 'push' than the comparatively extended burn of smokeless powder.

***At right:* This Winchester Model 1893 Pump Action Repeating Shotgun was used to quell an attempted train robbery near Tombstone. Lawman Jeff Milton survived the gunfight, but the outlaw was mortally wounded.**

and the Age of Powder



In 1900, the passenger train at Fairbank, Arizona, came under attack by four hold-up men.

Wells Fargo shotgun guard Jeff Milton effectively ended the robbery attempt with buckshot. Mortally wounded, outlaw John Patterson died shortly after being taken to Tombstone.

Milton also stopped some lead and soon found it necessary to have four inches of shattered bone removed from his left arm.

The road to the arms maker's goal of higher velocity, flatter trajectory, and better accuracy and range of shooting could only be unblocked by the development of a propellant superior to black powder. Two discoveries that were made during the 1840s were important to the development of such a superior gunpowder. In 1845, the inventor Schoenbein of Basel, Switzerland first produced nitrocellulose, or 'guncotton,' by nitrating cellulose. A year later an Italian chemist, Asconio Sobero, discovered nitroglycerin, formed by the action of nitric and sulphuric acids on glycerin. Nitrocellulose and nitroglycerin are powerful explosives. They contain carbon and hydrogen in combination with available oxygen to support combustion; both are unstable and capable of rearranging themselves with extreme rapidity into more stable compounds in the form of gases and with a concomitant great increase in volume.

In their original form, neither nitrocellulose nor nitroglycerin are usable for small arms, due to their instability. However, in 1885 a French Government chemist named Vieille discovered that nitrocellulose, when dissolved in ether or alcohol, produces a stable colloid which can be dried and used as a substitute for black powder. It proved impossible, however, to adapt nitroglycerin by a similar process, but within a few years Alfred Nobel and Sir Frederick Able combined nitrocellulose with nitroglycerin to produce a similar product. In both processes, the resulting pasty colloid was easy to handle and could be dried into grains, flakes or cylinders of various sizes. When detonated in the granular form, these mixtures produced very little smoke—hence, the granulated colloids came to be known as 'smokeless powder.'

Powder made by the Vieille process became known as single-base or bulk smokeless. The methods of its manufacture were sufficiently advanced by the late 1880s for powder companies to begin supplying the market in bulk. The powder made by the use of nitroglycerin was called double-base or dense smokeless. More powerful, and originally somewhat more difficult to control, this latter powder was made available during the early 1890s.

In addition to the characteristic the name suggests, smokeless powder burns cleaner than black powder and is by weight and volume many more times as powerful. Even more important is the control which can be exercised over the rate at which it burns. This is done by manufacturing the powder in different shapes and sizes, and by coating the grains with graphite. Slowing down the rate of combustion makes it possible to overcome the inertia of the projectile and start it on its way before the full pressure of the gas is developed. This 'slow' buildup of pressure gives greater velocity to the projectile through an extended push.

GOVERNMENT CONTRACTORS
No 1
WINCHESTER PRIMERS
No 2
No 1
BERDAN PRIMERS
No 2
WINCHESTER REPEATING ARMS CO.
NEW HAVEN, CONN. U.S.A.
CAPACITY OF WORKS 2 000 000 CARTRIDGES DAILY.

Increased velocity gives flatter trajectories to bullets and improves the accuracy of shooting. The greater power of smokeless powder makes possible both the use of relatively compact cartridges, and increase in potential velocities. In turn, higher velocities make possible the use of lighter bullets which, due to their speed at the moment of impact with a target, have an effect as satisfactory as the large, heavy pieces of lead that were hurled by the heavier-caliber black powder firearms.

While the superior qualities of smokeless powder insured its adoption, the introduction of smokeless powder added to the complexity of design and manufacture of both guns and ammunition. A whole host of chemical, metallurgical, and ballistical problems had to be solved before satisfactory results could be obtained. Among the more immediate consequences was the birth of the modern rifle and the subsequent evolution of guns with greater accuracy. Also, the use of smokeless powder hastened the substitution of scientific methods and laboratory techniques for rule-of-thumb and empirical procedures in the manufacture of guns and ammunition.

One of the major problems affecting all ammunition companies using the early smokeless powder came from the much-increased variety of powder mixtures. Black powder had long been standardized and limited to a few brands. But, in the case of smokeless powder, the different methods used in its manufacture and the wide variety of forms manufactured—each with a different burning speed—combined with the constant experimentation in improving all of the above, smokeless powder became available in dozens of varieties, each with its own particular characteristics.

It was several years before the performance of these various powders could be properly analyzed, and then standardized in ammunition use. To add to the problem, the powder companies at first had great difficulty controlling the quality of smokeless powder. Variations in different batches of the same brands made it even more difficult for ammunition producers to maintain a uniform performance in their own product.

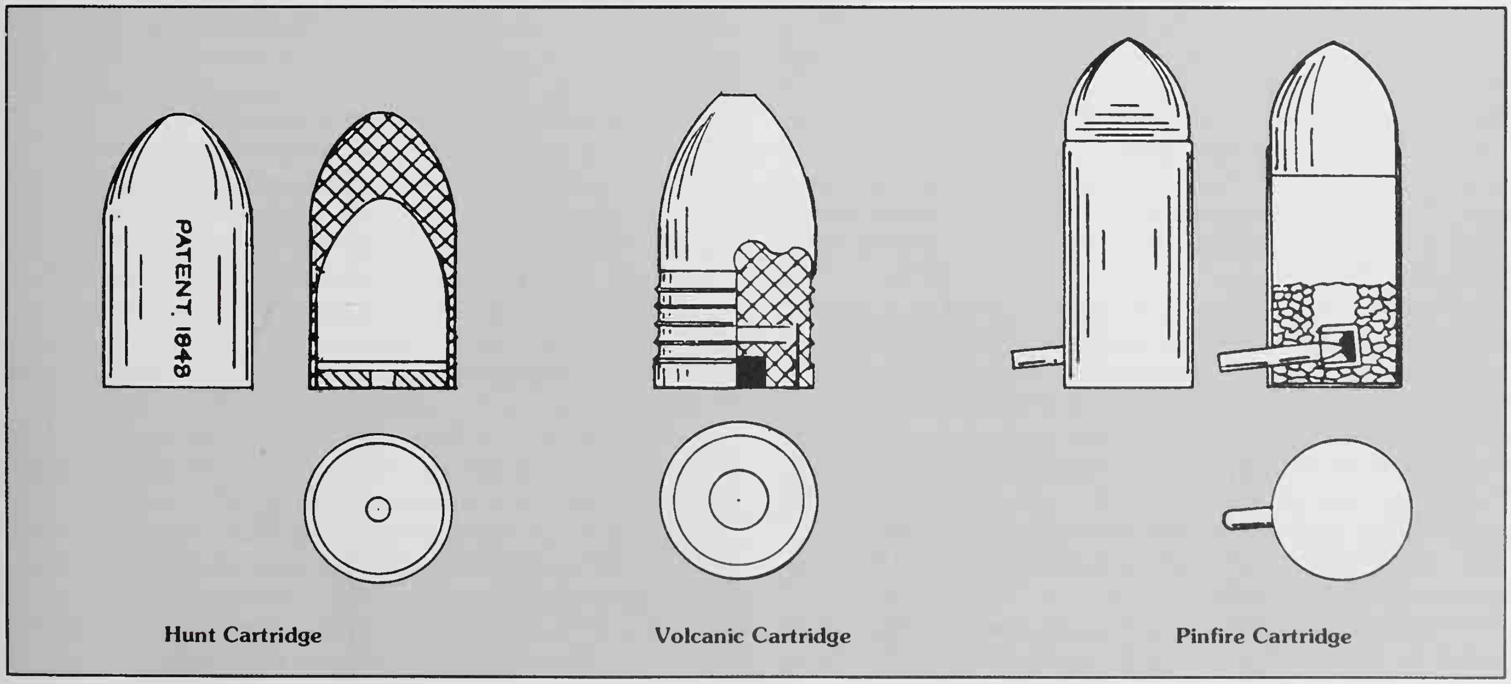
At left: A display of Winchester cartridges, circa 1879. _Below:_ Various early Winchester cartridges, including the cartridge _(center)_ produced by the Volcanic Arms Company.

The greater potency of the new propellant made for a more delicate balance between the kind of powder used, the weight of the bullet and the design of the case; it was somewhat tricky to arrive at optimal performance. Of course, the dangers from overloading were increased, especially after 'double-base' or dense smokeless powder became available.

As one authority pointed out: 'If we load an abnormal amount of smokeless powder into a cartridge, or use a heavier or tighter, or harder bullet, or crowd a lot of powder into a small powder chamber, the pressure curve rises very rapidly. For example, if a maximum safe charge in a certain cartridge gives 50,000 pounds pressure, one grain of additional weight may give 60,000 pounds and cause the brass cartridge case to expand so much that it sticks tightly in the chamber and is difficult to extract, and 3 grains of powder above the maximum charge may give about 75,000 pounds and blow out the primer, and allow gas to get back into the gun's mechanism, and 5 grains above the normal maximum charge may disrupt the case entirely, and the powerful gas escaping to the rear may completely demolish the breech action of the weapon.'

Often the solution of one problem led to another. This is illustrated in connection with bullet design and construction. As we have said, the greater pressure and higher velocity generated by smokeless powder permitted the use of smaller-caliber bullets with the same, or a better, impact on the target than larger calibers using black powder. Decreasing the caliber, however, reduced the diameter of bullets relative to their length. In order to keep them from 'keyholing' or tumbling end-over-end in flight, it became necessary to increase their rate of spin, which was done by increasing the twist of the rifling in the gun barrels. This brought a further complication: when the lead or lead alloy bullets were forced at the greater speed through the rifling, they tended to disintegrate or become deformed.

By 'jacketing,' bullets within a thin layer of gilding metal or cupro-nickel, ammunition companies were able to overcome this tendency of the soft-lead bullets to disintegrate. Furthermore, the hard surface gave the projectile a better hold on the rifling of the gun barrel, increasing its spin and accuracy in flight and resulting in greater penetration of the target.



It was then discovered that completely jacketed bullets could penetrate a target without necessarily inflicting any serious damage, which was not a desirable trait for game-hunting cartridges. Finally, a solution was arrived at wherein the noses of jacketed bullets were left uncovered, and this allowed for mushrooming upon impact.

The difference in the penetration of a softnose and a fully jacketed bullet is illustrated by tests made of the WCF (Winchester Center Fire) .30 caliber smokeless powder cartridge. From a distance of 15 feet, the soft-nose bullet went through 12 dry pine boards, each seven-eighths of an inch thick. The fully jacketed bullet penetrated through 35 boards from the same distance.

The adoption of smokeless ammunition was a slow process. Not for some 10 years after the new propellant was first introduced were smokeless loads sufficiently perfected to meet the approval of any large number of shooters.

Winchester began experimenting with smokeless powder as early as 1888. Indicative of the difficulties encountered is the fact that the first announcement of smokeless loads did not come until five years later, the catalog for 1893 carrying the statement that the Company would load, on order, its paper Rival shot shells with smokeless (also known as 'nitro') powder.

The following year the Company announced that it was carrying one product line of loaded smokeless paper shot shells in stock. This was the Winchester Leader, the Rival being changed to black powder. This policy was continued until 1905, when a second smokeless load was added. At the same time the number of hand-loaders' shells (which were empty, but came already primed) to be used with smokeless powder was increased from two to four product lines during the same period.

While the use of smokeless powder in shot shells presented some problems, it proved much more difficult to use the new propellant in metallic cartridges. Winchester management devoted most of its attention to the solution of this latter problem during the succeeding years.

The first smokeless metallic cartridge produced by the Company, the .30 US Army, for use in the Winchester Single Shot and the newly-adopted United States service rifle, the Krag-Jorgensen, was announced in the Company catalog for April 1894.

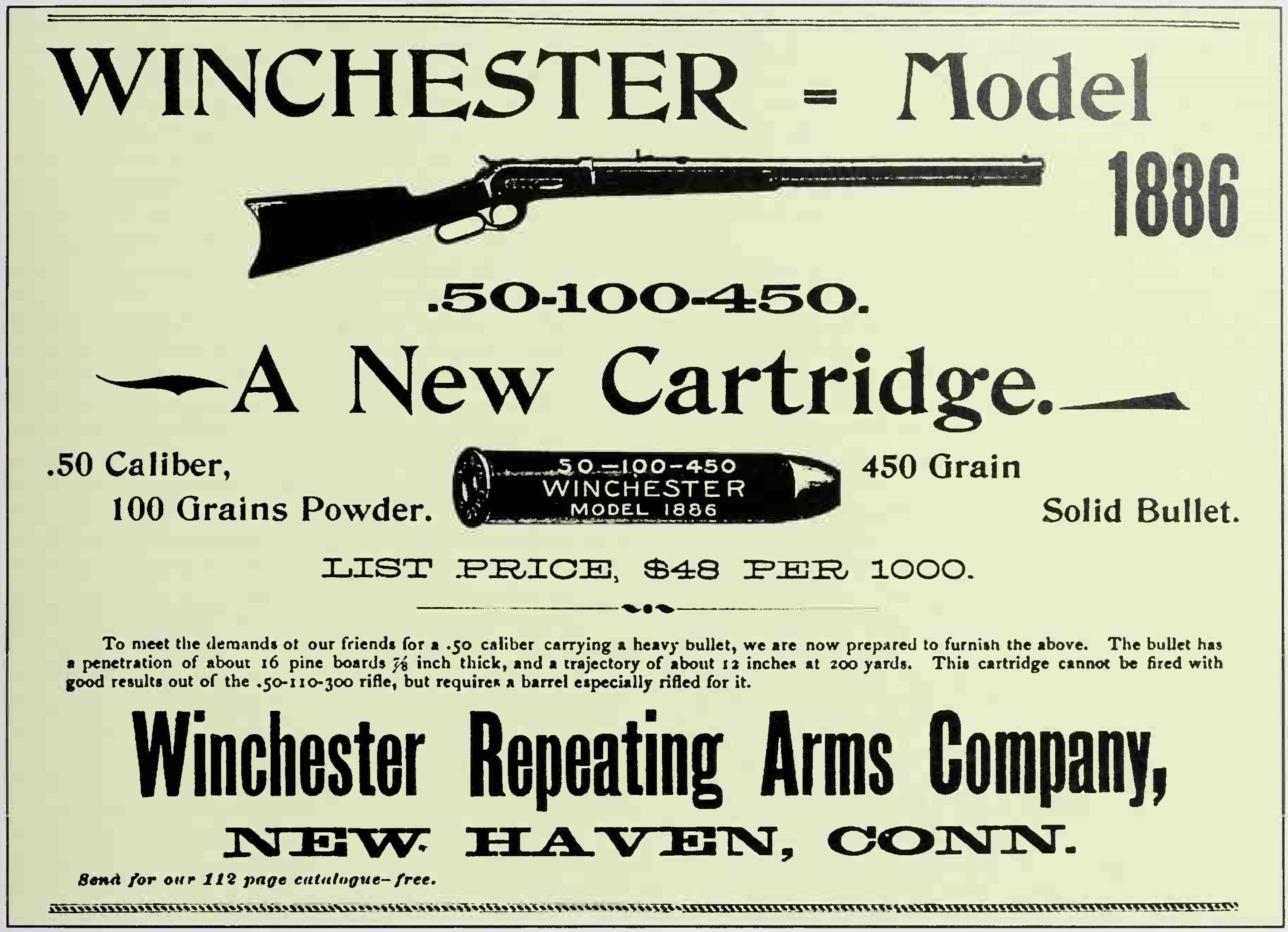
With the statement that 'new smokeless cartridges will be added as fast as experimental work permits,' the list of smokeless loads was increased to 17 the following year. Actually, in all but four of these cartridges, smokeless powder was substituted for black powder without any attempt to attain higher velocities.

This was explained in the following head note to the list: 'The smokeless cartridges enumerated below may be divided into two classes. In the one class are those cartridges in which black powder has been replaced with smokeless powder. In these, to meet the requirements of the guns for which black powder cartridges were intended, no attempt has been made to get additional velocity. The name of the black powder cartridge has been retained, and the word 'Smokeless' added. The smokeless cartridge in point of excellence differs from the black powder cartridge only in smokelessness and cleanliness. Velocity and penetration remain the same. In the other class, cartridges may be numbered the .236 Navy, .25-35 Winchester, .30 US Army, and .30 Winchester Smokeless. These are purely smokeless cartridges.

'The velocities obtained cannot be gotten with black powder, nor have we been successfully able to use lead or alloys without metal patches (jackets). These are cartridges belonging entirely to the smokeless powder class, and cannot be used with black powder. Their excellence is in high velocity and consequent flat trajectory. The full metal patch gives great penetration. The soft nose bullet will expand to give effects upon animal tissues very much greater than the small caliber would otherwise enable.'

The production of even this rather modest list of smokeless loads had, by 1895, taxed the ingenuity and facilities of the management, and TG Bennett had already taken steps to put the work on a more scientific basis by establishing a laboratory. This laboratory had its beginning in about 1886 when Thomas Addis, the Company's foreign sales agent, purchased a Schultz chronoscope in Europe. This was a device which measured bullet velocities, and evidence of the Company's deepening commitment to the 'scientific approach' came a short time later, when Addis acquired, also in Europe, a Boulenge chronoscope, which was a superior instrument used for the same purpose.

Addis (at such times as he was in New Haven) and TG Bennett did considerable testing with the chronoscopes. These experiments appear to have continued on an intermittent basis, largely when the two men could spare time from other duties, and did bear some fruit after a bit of



WINCHESTER = Model 1886

.50-100-450.

A New Cartridge.

.50 Caliber,
100 Grains Powder.

50–100–450
WINCHESTER
MODEL 1886

450 Grain
Solid Bullet.

LIST PRICE, $48 PER 1000.

To meet the demands of our friends for a .50 caliber carrying a heavy bullet, we are now prepared to furnish the above. The bullet has a penetration of about 16 pine boards ⅞ inch thick, and a trajectory of about 12 inches at 200 yards. This cartridge cannot be fired with good results out of the .50-110-300 rifle, but requires a barrel especially rifled for it.

Winchester Repeating Arms Company,

NEW HAVEN, CONN.

Send for our 112 page catalogue—free.

At top: **A Winchester Model 1886 .45-90 Caliber WCF Rifle, and an advertisement *(above)* for new high power cartridges for the Model 1886. Cartridges of this sort created a revolution in firearms design.**

trial and error: in February 1889, the Company catalog included its first ballistics table, which was expanded in later editions.

With the advent of smokeless powder, laboratory testing had taken on a new significance. After it was clear that the new powder had come to stay, TG Bennett moved to put the laboratory on a more formal basis and, in 1894, he employed Edward Uhl, a recent graduate of the Yale Sheffield Scientific School, to take charge.

This laboratory represented a major step in the direction of scientific control over developmental work and manufacturing processes. This is well illustrated in the case of priming mixtures. Prior to the introduction of the laboratory, the development and production of priming mixtures were entrusted to the primer shop foreman, who had long experience in the work. New mixtures were tried out empirically, and the foreman had a 'little black book' into which he entered the various formulas. This information was available only to the foreman who kept it a closely guarded secret. It is said that the Company did not dare fire the primer shop foreman, for without his little black book, the primer shop would shut down. Adding to the complexity this system imposed, there was always also the possibility that he would go over to a competitor for more money.

The demands for smokeless powder primers made this system inadequate. The new propellant required a different kind of primer 'burn' than did black powder. Hundreds of mixtures were tried, and the configuration of the primer was changed many times before satisfactory results could be obtained. However, with the application of chemical analysis it was not only possible to compound more accurate and satisfactory mixtures, but in the laboratory, the existing formulas lost their mystery and the little black book lost its significance.

Essentially the same condition applied in the case of metal working. The tempering methods used to anneal brass, harden steel and so forth had been evolved over many years of empirical observation. The men in charge of these operations were master craftsmen who had a 'feel' for their work. With the advent of smokeless powder, greater pressures were put upon gun chambers and cartridge cases, and greater heat was generated. The Company, already deep into their fascination with science, gave up on traditional metallurgy and plunged into the laboratory with that aspect of their operations as well.

The importance of metallurgy is illustrated by the following example from 1898, after the laboratory was in operation. Working on a Government order for .30 caliber smokeless ammunition to be used in the Spanish-American War, the Company had lot after lot of ammunition rejected by the Government inspector because of defects. These took the form of 'cut-offs,' or separation of cartridge cases about a half-inch from cartridge bases; splits in the necks of cartridge cases; and weaknesses in casings that allowed expansion in the firing chamber to the point that some cartridges could not be ejected after being fired.

Henry Brewer, a metallurgist par excellence, was brought in to help solve the difficulty. According to him, the cartridges lacked the proper crystal structures in various parts of their designs, and only after careful analysis had the proper crystal structure for each part of the cartridge been arrived at.

As the manufacture of smokeless powder ammunition was pushed ahead, the operations of the laboratory expanded. By 1901, the work had become extensive enough to warrant the establishment of a chemical division and Joseph Wild, a graduate of the Yale Sheffield Scientific School, was put in charge. In 1904 he was succeeded by William Buell, a graduate of the same school, with several years experience in the laboratories of the Pennsylvania Railroad. Buell was an exceptionally able chemical engineer and under his direction the work of the laboratory assumed increasing significance over succeeding years.

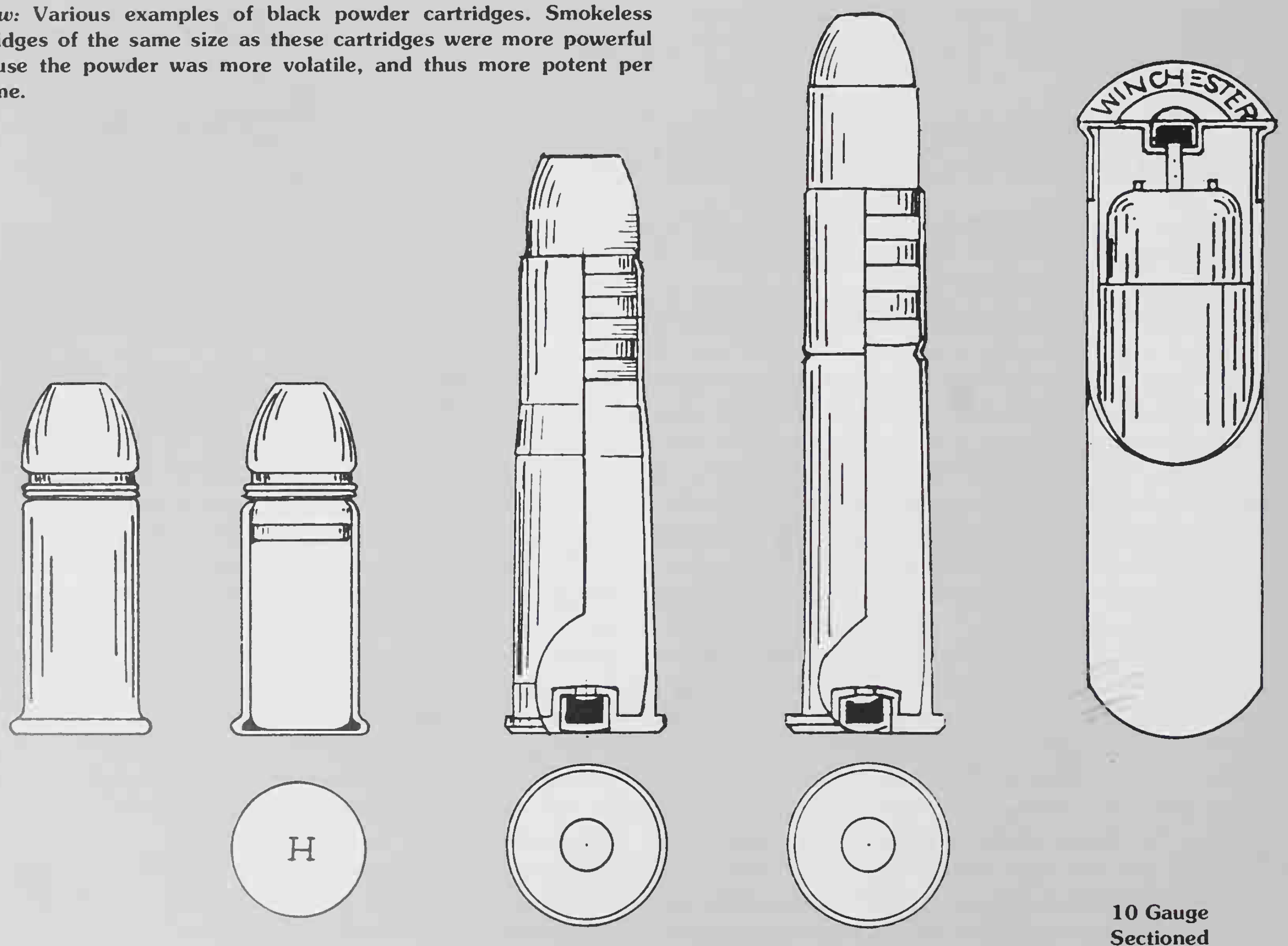
Winchester kept the promise it made in 1895 to add new smokeless cartridges as fast as they could be developed. By 1905, the list had grown to 100 and in 1914 the total came to 175. Many of these were available in both full jacketed and softnose bullets, so the actual number of individual loads was probably at least 20 percent greater than indicated.

A considerable number of these new cartridges were still black powder types with smokeless powder substituted, but—as with some of those mentioned earlier in this chapter—with no attempt to achieve higher velocities. These were designed to be used in firearms manufactured before smokeless powder was introduced. Due to the greater pressures developed with smokeless powder, it was dangerous to use high pressure smokeless loads in these black powder firearms.

A second group, including a line of Winchester high velocity cartridges, was described as giving higher velocity and increased muzzle energy, with only a moderate increase in initial pressure. Many of these cartridges could be used safely in the Company's Model 86 and Model 92 rifles, originally designed for black powder ammunition, but users were cautioned against using high velocity cartridges in the Model 73.

The third class of smokeless cartridges were high power loads such as the 6mm Navy, the .30 US Army, the British

***Below:* Various examples of black powder cartridges. Smokeless cartridges of the same size as these cartridges were more powerful because the powder was more volatile, and thus more potent per volume.**



Henry .44 Flat Rimfire

.45-75 Center Fire

.45-70-500 Center Fire

10 Gauge Sectioned Shot Shell

.303, and such Winchester calibers as .30-30, .33, .35 and .405, and could be used safely only in guns designed especially to handle high pressures. Not all of the smokeless loads offered in 1914 had been originally developed by Winchester. In line with its policy of producing a full line of ammunition for all types of firearms, the Company expanded its manufacture to include practically all the new cartridges brought out by the US Government and the other arms and ammunition companies.

While adding smokeless loads to its ammunition line, Winchester did not reduce the manufacture of black powder metallic cartridges and components. Including loaded and empty primed cartridge cases, bullets, blanks and other components, the catalog for 1914 listed approximately the same 375 black powder items that had appeared in 1890.

Beginning in 1911, the Company offered to load rimfire and center fire black powder pistol cartridges with 'Lesmok' at no extra cost. Lesmok was a semi-smokeless powder developed by Du Pont. This powder added a slight degree of muzzle velocity, and hence, accuracy to small caliber ammunition. While it gave off more smoke and caused more bore fouling than smokeless, the fouling was of such a nature that it did not cake and harden in the barrel, and firing did not have to be interrupted for cleaning.

While sales of factory-loaded ammunition had grown enormously over the preceding quarter century, a large number of shooters during the early 1890s still preferred to load or reload their own metallic cartridges. The reasons for this preference are well stated in the following quote from AC Gould's book, *Modern American Rifles*, published in 1892.

'Every person who shoots a rifle will be likely to sometime prepare ammunition. One rarely finds an expert rifleman who uses factory cartridges, especially if he shoots at targets, or where extreme accuracy is desired. Factory made cartridges are expensive and, however excellent when leaving the factories, may rapidly deteriorate by being stored in an unfavorable place. Tyros usually shoot factory cartridges; the old and skillful marksman rarely does. But, besides the questions of economy and more reliability in properly reloaded cartridges, is the necessity of reloading when one is located away from the large cities, where it is impossible to procure the products of the factories.

'If residing in a section where gun dealers are numerous, the great variety of cartridges make a very large stock necessary (if the dealer would keep a full line) and as many of the cartridges would be seldom called for, the stock would become old and deteriorate. Therefore, only the most called-for rimfire and center fire cartridges are found in the average gun store. Thus it seems necessary for a rifleman—if he desires to economize, to have reliable ammunition and to be able to supply himself with such at will—to possess a knowledge of how to reload rifle cartridges.'

Winchester had long supplied the demands of the hand loaders, and continued to advertise the fact that 'shells of all our center fire rifle cartridges are made of extra thickness for this purpose.' A considerable part of the Company's sales was made up of ammunition components, including primed and unprimed empty cartridge cases, wads, bullets and extra primers.

In 1890, the Company listed in its catalog two types of reloading tools, in addition to bullet molds and charge cups for measuring powder. Also included were directions for reloading and recommendations of the best types of powders. Between 1890 and 1915, there was no change in policy and the Company continued to cater to the hand loaders using black powder.

The hand loading of smokeless powder was a different proposition, and beginning in 1898 the Company made every effort to discourage the practice. While this attitude may have been colored by a desire to increase the sale of factory-made ammunition, the main reason was based upon the increasing number of accidents suffered by shooters using hand loaded smokeless cartridges.

As a large number of these accidents involved Winchester firearms, the management was especially interested in taking steps to eliminate them. In the catalog for 1898 the Company, under the heading, 'Reloading Smokeless Powder Cartridges Impractical,' explained its attitude as follows.

'We are constantly in receipt of letters of inquiry regarding the reloading of smokeless powder rifle ammunition, and we therefore make the following general statement.

'It has been the common experience of persons using reloaded smokeless powder cartridges to have a large number of shells so reloaded rupture in the gun. Extensive experiments carried on by the Winchester Repeating Arms Company—and by the Ordnance Department of the United States Army—with shells, guns and smokeless powders of nearly every known manufacture, have alike failed to find a remedy for this difficulty.

'Experiments show that after the first firing with smokeless powder, the metal of the shell undergoes a slow but decided change, the exact nature of which the best experts have as yet failed to determine. No immediate deterioration attends the shooting of smokeless powder: for, by reloading and shooting immediately, the shells may be shot many times with no sign of rupture.

'If, however, the fired shells are not allowed to stand for two or three days, no matter whether they are cleaned or uncleaned; wet or dry; or loaded or unloaded, the result is always the same—namely, the metal becomes brittle, and rupture of the shells at the next discharge is probable.

'For this reason, the Winchester Repeating Arms Company cautions its patrons against the reloading of smokeless powder rifle ammunition, and wishes to do its utmost to discourage this practice.'

It turned out that the cartridge casings had an adverse reaction to the residue left by the primers then being used; with some thought and effort, this danger was overcome. However, the use of the very potent double-base smokeless powder had become more prevalent. This gave birth to a new danger—namely, overloading. This gave rise to the following warning concerning hand loading in the Winchester catalog of 1900.

'The many smokeless powders on the market differ so greatly in their various qualities and characteristics, that their use may be attended with very great danger through improper loading. Many smokeless powders—excellent powders in themselves and perfectly safe and satisfactory if used in the proper amounts and in the cartridges for which they are designed—may become very dangerous when used in other cartridges, or in the wrong amounts.

'Smokeless powder varies greatly in bulk, density, rapidity of combustion chamber pressure and charge required, and for this reason it is very unsafe to load smokeless powder, unless the means of determining the chamber pressures are at hand. Thirty grains of one powder might be a perfectly safe and satisfactory load, while 30 grains of another powder in the same cartridge might burst the strongest nickel steel barrel.

'Many things tend to increase the chamber pressure to an extent little to be expected by the novice. An increase of but a few grains in powder charge will sometimes produce the most astonishing results, and what was previously a perfectly safe load may thus be rendered a very dangerous one indeed.'

Winchester was joined in this campaign by the other ammunition manufacturers and by the powder companies. How effective these warnings were in minimizing the hand loading of metallic cartridges is impossible to determine, but the following is an interesting observation by Townsend Whelen, writing in 1918. 'An acquaintance with thousands of riflemen throughout our country enables me to assert that very few of them load their own ammunition.'

There is no question that these warnings helped to alert shooters to the necessity of being aware, more than ever before, of the potency of some of the new grades of gunpowder.

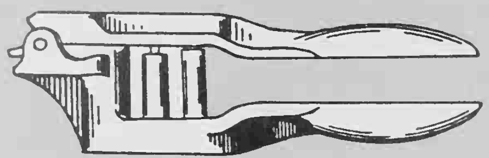
While the advantages of smokeless over black powder were not as striking in shot shells as in rifle ammunition, the relative cleanness and ballistic economy of smokeless were sufficient to bring about its popularity in shotgun ammunition. The smooth bores and larger diameters of shotgun barrels, as compared to the rifling twists and relatively small diameters of rifle barrels, made for a relatively simpler adaption of designs from black powder to smokeless powder ammunition; even so, the difficulties encountered were formidable enough.

As was the case with metallic cartridges, the varieties of smokeless powder types (including the stronger, double-base types) necessitated continual changes in the composition of priming mixtures, and the balance between powder charges and the weight of the shot. Among other things, the greater heat generated by smokeless powder tended to melt shot made of pure lead. Therefore, chilled shot—made by adding antimony as a hardening agent—had to be used. Also, the higher explosive pressures necessitated the use of wads that were more elastic. Beyond that, a number of changes were made in the design of the head and brass portions of the heavy paper shot shells in order to increase their strength.

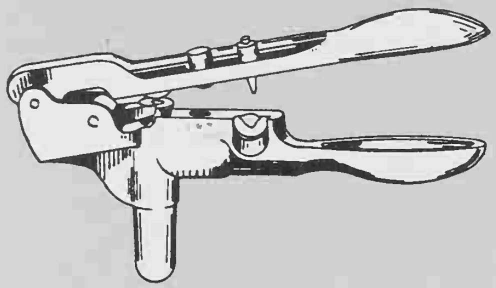
Because of the higher pressures developed by smokeless loads, all the ammunition companies had trouble with their paper shot shells 'cutting off,' or separating at the junction of the paper body with the brass head of the shell.

On 9 June 1896, John Gardner, superintendent of Winchester's cartridge shop, was granted US Patent 25611 on a method of construction designed to overcome this difficulty. The essential feature of his patent was the use of circumferential grooves around the 'collar' of the brass head of the shell. These grooves not only held the paper part of the cartridge more firmly in place, but also acted as a shock absorber by flattening against the walls of the chamber when the shell was discharged.

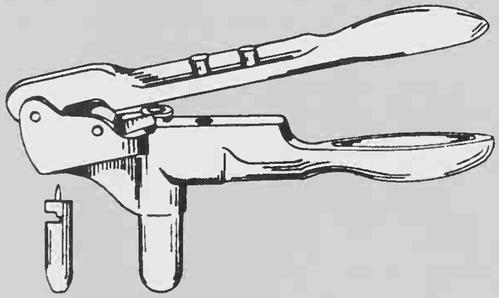
The advantages of this type of construction were so obvious that it was quickly adopted by other ammunition companies. Winchester brought suit against these concerns and forced them to abandon its use. However, Gardner's patent covered only the use of grooves around the entire circumference of the brass heads. Winchester's competitors found that they could get the same effects by indenting their name in the same position, and in this way were able to get the same effect without infringing on his patent.



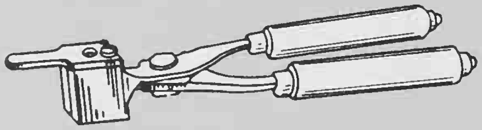
Reloading Tool
First Type—1874-1875



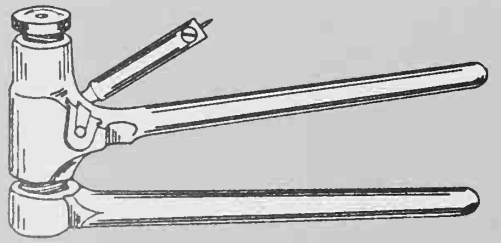
Reloading Tool
Second Type
First Listed 1875



Reloading Tool
Third Type
First Listed 1879



Bullet Mold
Winchester .44-40 Cartridge



Reloading Tool
Model 1891

Gardner's patent solved but one of the many problems connected with adapting shotgun ammunition to smokeless powder. Many of the same laboratory techniques applied in the case of smokeless metallic ammunition had to be applied to cure the ailments of smokeless shot shells. Winchester did not reduce its offerings of black powder shot shells because, as was the case with metallic ammunition, smokeless powder did not eliminate the demand for black powder loads.

Many shotguns were still in use which were not strong enough to handle the more powerful smokeless ammunition. Also, the smokeless loads cost more. In 1914, for example, the list price of loaded 'Nublack' 12-gauge black powder shells was $25 per thousand, while the corresponding smokeless loads in the Repeater and Leader brands were quoted at, respectively, $37.50 and $48 per thousand.

In respect to the hand loading of smokeless powder shot shells, Winchester—beyond cautioning against overloading—issued no warnings. On the contrary, beginning in 1895 and continuing thereafter, the Company included tables in its catalog giving the comparative strength of the various kinds of smokeless powder and their equivalents in black powders for the benefit of handloaders.

Also touted in the catalog were the advantages of the Company's empty shot shells that were designed for smokeless hand loads, and also, special wads and primers were added to the line of hand load ammunition components.

Nevertheless, the advent of smokeless powder did have an effect on shot shell hand loading, and contributed to a subsequent decline in the practice. Henry Brewer explained this phenomenon in the following quote.

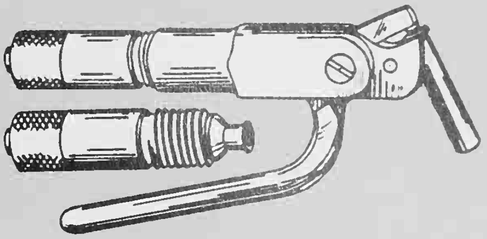
'Black powder loading was a pretty simple affair, but when smokeless powder came on the market, shot shell loading became very different and much greater knowledge, skill, and experience was required. There were a good many accidents resulting from overloading by inexperienced handloaders. As a result, quite a business was built up in various localities where game shooting was prevalent, by local handloaders who bought the empty shells, powder, wads and shot, and loaded the shells to meet the requirements and whims of their particular customers.

'These handloaders were usually themselves sportsmen and knew the requirements of the local sportsmen, and they also knew from personal experience good loads from poor loads. The local sportsmen came to rely on their advice as to loads and many of them built up a big reputation for their product and had correspondingly large sales.

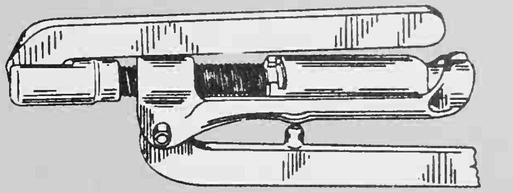
'This was especially true in the Chesapeake Bay region, noted for its duck and goose hunting. As a matter of fact, these handloaders were doing a better job than the factory loaders, for they were in closer touch with the shooters and were themselves shooters and sportsmen, and were constantly testing the results of their loads in the field.

'From the foregoing, it is apparent that the initial effect of smokeless powder was not to reduce handloading, but to put it more into the hands of specialists. It was only after the ammunition companies noted the popularity of these special loads and decided to expand their own offerings that handloading of smokeless shot shells as well as black powder loads began to decline.'

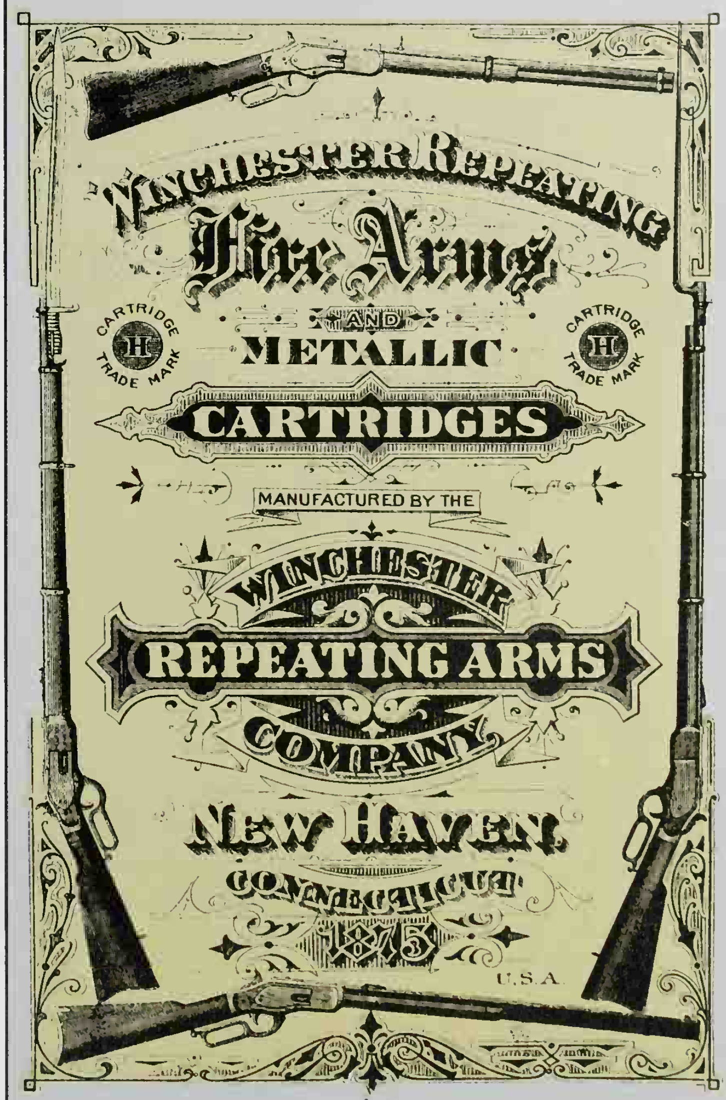
Until around 1895, neither Winchester nor the Union Metallic Cartridge Company seems to have made any particular effort to push their sales of factory loaded shells. Winchester did not even list loaded shells in its catalog until 1894, and during the early 1890s, there is evidence that both



Reloading Tool
Model 1894



New Model
Reloading Tool



Winchester Repeating Fire Arms and Metallic Cartridges

Cartridge H Trade Mark

Cartridge H Trade Mark

Manufactured by the

Winchester Repeating Arms Company

New Haven, Connecticut

1875

U.S.A.

Far left and at top: Winchester sold a number of reloading tools and bullet molds. The advent of smokeless powder contributed to the decline of hand loading. *Above:* An advertisement for the Winchester Repeating Arms Company.

companies were willing to sign an agreement not to load shot shells as long as they and the US Cartridge Company could continue to control the supply of components.

Several considerations apparently led to this lack of enthusiasm. The sale of components was highly profitable, and the early loading machines were relatively inefficient. The cost of factory loaded shells was too high to compete vigorously with hand loading economy, and there was no reason to think that the demand for loaded shells would be very great.

Between 1890 and 1895, the general situation changed. The rise of competing firms not only threatened the Winchester, UMC and USCC control over the manufacture of components, but specialized loading companies were beginning to build up large markets. Machinery had been improved sufficiently to make the margin between costs and selling prices more competitive.

Finally, the sales of factory loaded shells had shown a remarkable increase. Winchester's annual production of loaded shells, for example, grew from 23.2 million in 1890 to 67.5 million in 1895. It may be assumed that the production of loaded shells by UMC and the US Cartridge Company increased in approximately the same proportion.

Noting the success of the special hand loaders, Winchester management decided, in 1896, to expand its offerings of individual shot shell loads, and Bert Claridge was hired to take charge of shot shell loading. This was an excellent choice. Claridge had been in charge of the shot shell loading department of a large sporting goods house in Baltimore. He was an expert shooter, famous among the hunters and sportsmen of the Chesapeake Bay region for the quality of his hand loaded shot shells, and he knew from personal experience what powder-and-shot combination gave the best results under given conditions.

Under Claridge's direction, Winchester's list of shot shell loads began to multiply. He not only increased the number of standard loads, but paid particular attention to 'special orders,' which in many cases developed considerable sales volume. It was Henry Brewer's judgment that 'No other one feature of our loaded shell job played such an important part in building our sales as did Bert Claridge. Under his guidance, we led all the loading companies in smokeless shells, in spite of the fact UMC had always led in black powder Loads. Smokeless loads sold on quality to the more particular shooters, and it was Claridge who put our smokeless loads ahead of all others as to quality.'

This move by Winchester to cater more to the individual demands of shooters was followed by the other ammunition companies, and marked a decline in popularity of hand loading. From the early days of black powder, someone had always been interested in getting special performance from their firearm—a function that hand loading had always pointedly had, and which was now supplied, except for the very particular shooters, by many factory loads.

The demand for factory loaded shot shells continued to expand. Winchester's annual output of loaded shells grew from 67.5 million in 1895 to 243.4 million in 1907.

The use of smokeless powder, plus catering to the demands of individual shooters, multiplied the variety of loads in shot shells. In 1885, just prior to its first sale of loaded shells, Winchester carried only four brands of paper shot shells and two brass shells. In 1914, the catalog listed two types of brass shells, four empty paper shot shells, and six brands of loaded paper shot shells.

This small number of brands completely obscures an almost fantastic increase in individual loads that were being manufactured by the latter date. It was an expansion that was closely related to the relationships among the powder companies, the loading companies, and the users of shot shells. Prior to the advent of factory loaded shells, powder companies had concentrated their sales efforts on the hand loaders. Dealer and jobber connections were carefully built up, and powder companies employed expert shooters as 'missionary salesmen,' whose function was to build up a preference for particular brands of powder.

When the manufacturers started loading shells at the factory, they not unnaturally stressed the qualities of their ammunition and did not feature the powder brands. This move threatened to upset or destroy the whole pattern of consumer-dealer-jobber relationships built up by the powder companies. Not wishing to fight the powder companies in their efforts to expand the sales of factory loads, the ammunition companies began quite early to furnish shot shells loaded with the brand of powder specified by the buyers. This, in itself, added to the multiplicity of different loads; but, because shooters also had preference for different combinations of powder and shot sizes, the companies also extended this option to purchasers.

Even before smokeless powder became widely adopted, the variety of individual shot shell loads had mushroomed. In 1895, just a year after it had first listed loaded shells in its catalog, Winchester was prepared to furnish to its customers, at no extra cost, a choice among 23 combinations of shot-and-powder loads, 16 sizes of shot, and at least 12 brands of powder.

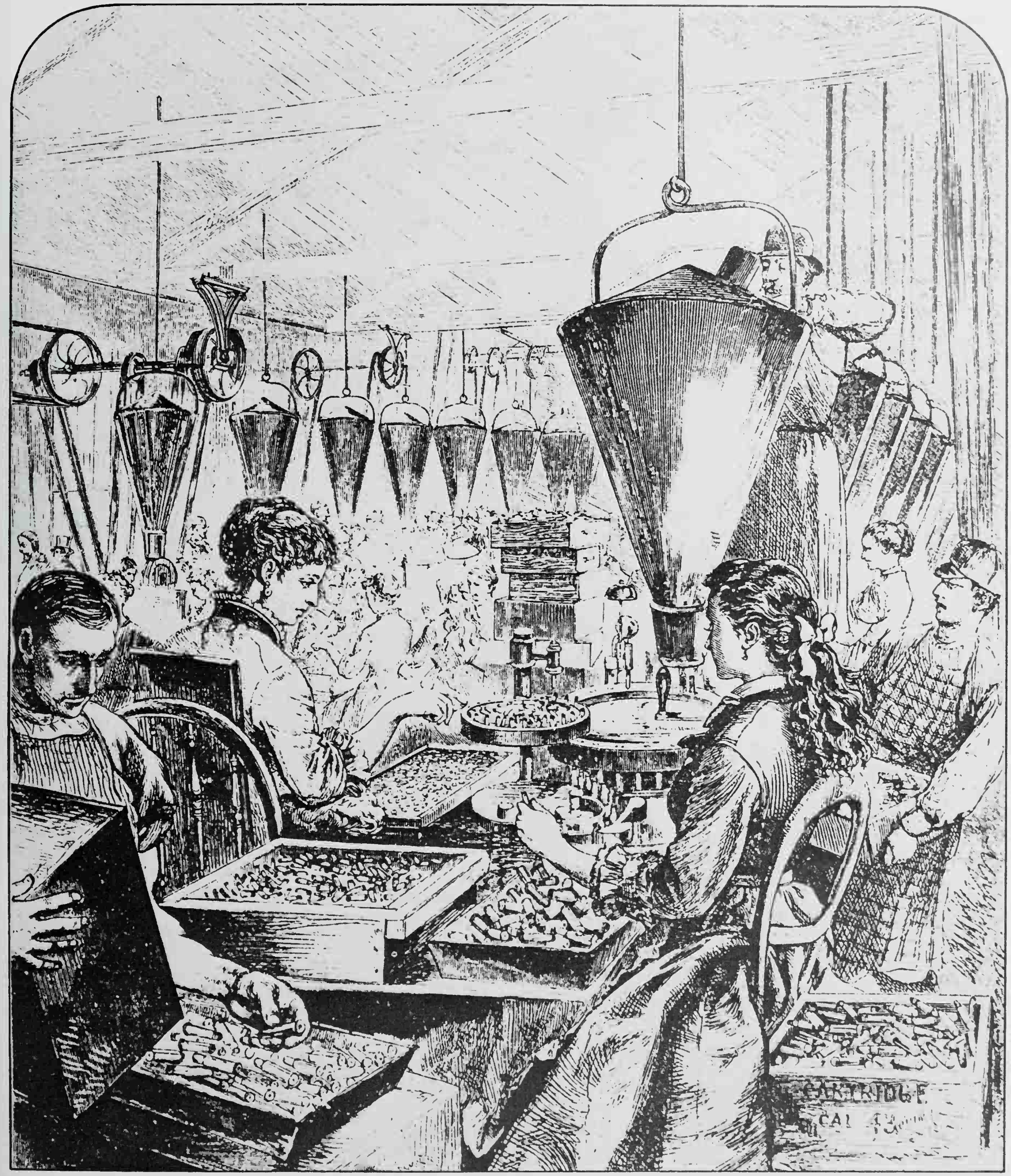
The result was between four and five thousand individual loads. After the introduction of smokeless powder, the list grew steadily—largely because of the increase in powder brands. It has been estimated that, by 1907, Winchester's total allowable loads came to 14,383.

The increased variety of shot shell loads added greatly to the manufacturing problem in this part of the business. The shooting season began in the fall and continued through the winter. Orders began to come in during the late spring and early summer—but until these orders were received and the particular loads were known, production could not begin. The result was intense activity during the summer months, followed by a comparative lull in activity in the off-season.

Assembling the finished product for shipment was a complex task. Each case had to be carefully labeled. Not infrequently, an individual order would call for several varieties of powder. The Company also had to be careful not to have excessive stock on hand at the end of the season—partly because particular loads might not be popular the following season, and partly because shot shells loaded with smokeless powder were subject to extreme deterioration unless very carefully stored.

Beginning around 1901, ammunition companies moved to spread their production over a longer period by making special agreements with jobbers. Under this arrangement, if a jobber would order shells by the carload on or before March 15, he would be allowed to pay for the shipment the following September and still receive a discount. These arrangements were carefully worked out under the supervision of the Ammunition Manufacturers' Association.

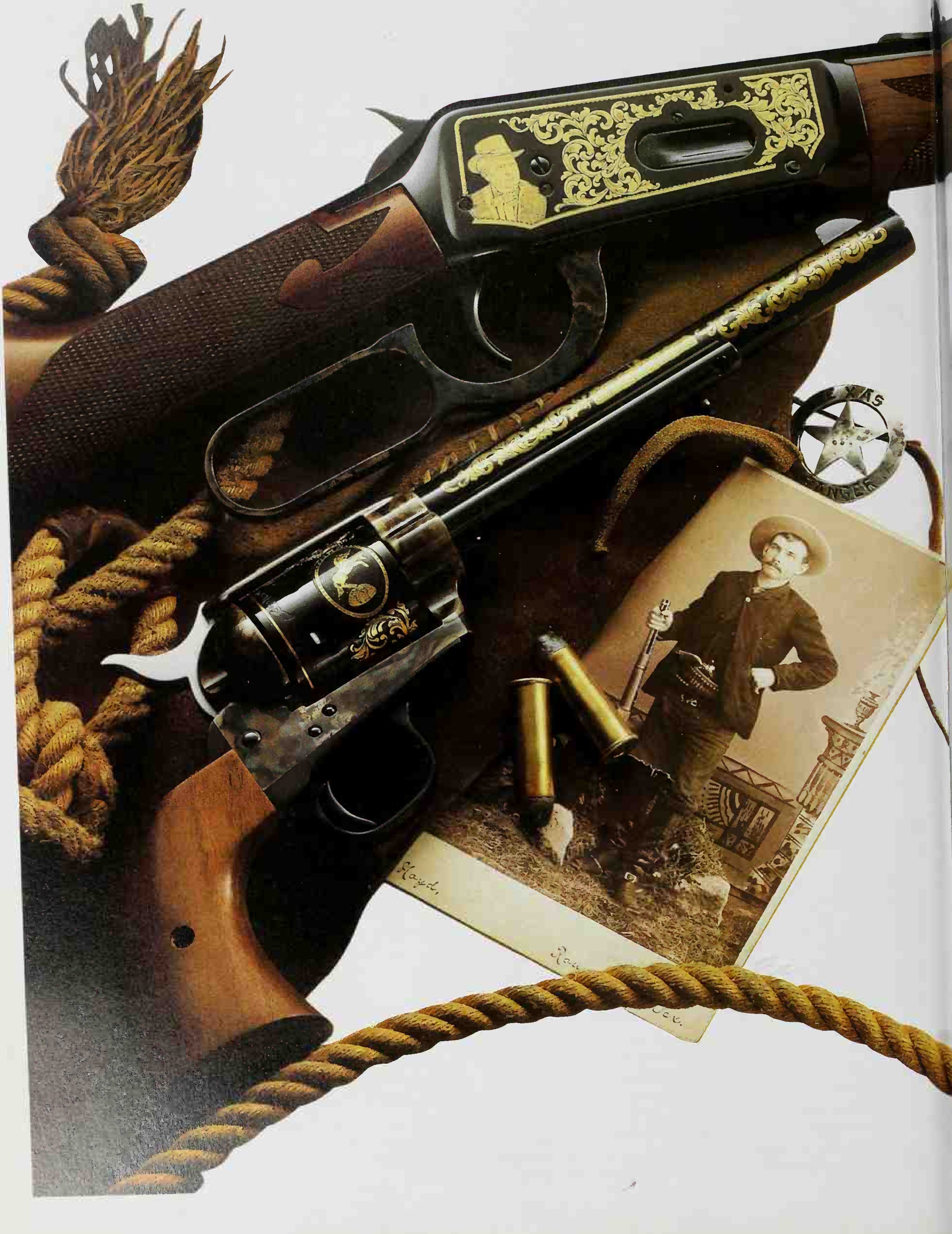
Sometime around 1907, the Company began to restrict the extreme variety of their factory loads by listing definite shot sizes for each of the smokeless loads which would be



Above: **A typical ammunition factory during the Civil War era. Notice the number of female workers and the box of .43 caliber cartridges, a popular cartridge of the time.**

furnished at standard prices. Orders for shot sizes not on the standard list were accepted only at an increased price. About the same time, the Company began to restrict its powder loads to specific brands.

While these moves helped somewhat to reduce the variety of loads, no determined attempt was made to actually cut the list of loads until after World War I. In 1921, the various ammunition companies moved to eliminate some 5200 loads from their shot shell lists. These 5200 loads that were eliminated comprised but 10 percent of all their business.


EXAS
ANGER
Floyd,

With the cooperation of the Department of Commerce, the manufacturers moved to simplify shot shell loads still further. In 1924 a committee, consisting of George R Watrous of the Winchester Repeating Arms Company and HJ Strugnell of the Remington Arms Company, was appointed by the ammunition manufacturers to study the possibility of a further reduction in number of loads. On 1 January 1925, the manufacturers further reduced load combinations to 1747 in all. Further elimination brought the list down to 137, total, by 1947. As you may well suspect, this marked a resurgence in hand loading, as there are always those who are willing to economise—and to take their chances on their own expertise.

Mention has already been made of the importance of improved machinery in loading shot shells. There is some evidence of a considerable improvement in these machines and in the general methods of manufacture during the 1890–1914 period. Available information is lacking for any discussion of these beyond noting a general trend toward increasing labor productivity. It is of interest that, of some 77 patents taken out by Winchester during this period, 51 covered metallic ammunition and shot shell design, 11 applied to primers and 15 to machinery used in the manufacture of both metallic ammunition and shot shells.

Not all the ideas contained in these patents were utilized, of course, but at the same time a number of improvements were introduced which were either not patentable or which the Company felt could be kept secret without being patented. The importance attached to certain of these "secret" manufacturing processes is illustrated by the following experience of Henry Brewer.

While no date is specified, it must have been around 1900 when he was called into the office by TG Bennett, and was told that the Union Metallic Cartridge Company was being sued by a workman who had been injured in their loading room. They had asked Bennett to send someone familiar with loading machines to examine their machines, so he could testify as a loading expert that they were designed and operated with a reasonable degree of safety.

Brewer states, 'Mr Bennett directed that I go to UMC and do whatever I could to help them in the matter. I was greatly elated, because this gave me an opportunity of seeing the UMC loading room—so far as I know, no Winchester representative had ever been in their loading room. It seemed to me a great opportunity to see how they did things—and possibly pick up some good ideas.

'I therefore said to Mr Bennett, "There is no objection, I suppose, to my keeping my eyes open and seeing what I can see?" Mr Bennett replied, "Now Brewer, you are going there at their request, do what they ask you to do, but don't go prying into things that are none of our business." Mr Arthur Hooper, Vice President, who was sitting at the adjoining desk spoke up, "Why, Tom, there is no objection, is there, to the young man keeping his eyes open?" So I went determined to learn all that I could that might be of help to Winchester.'

Brewer made the most of his opportunity, and when he returned to New Haven, he informed TG Bennett that Union Metallic Cartridge Company had Winchester 'licked a mile in the matter of the cost of loading.' This, he explained, was because the UMC loading machines were operated by one operator each, whereas the Winchester loading machines required four operators. The UMC machines had automatic devices for feeding wads and shells, whereas the Winchester machine required one girl to feed shells and two girls to feed wads, and a boy to tend the machine.

The speed of the Winchester machine was limited to the speed of the girl feeder, and our daily output was generally a little less than 25,000 shells per day, whereas the UMC loading machines were turning out over 30,000 comparable loads per day with only one operator.

Brewer went on to say, 'I suggested to Mr Bennett that we immediately design automatic wad feeds and automatic shell feeds for our loading room, so that we could reduce the number of operators and increase the output to equal that of UMC loaders, and I told him that I thought if we could accomplish this, we could save $50,000 per year.

'Mr Bennett turned to Mr Hooper and said to him, "Hooper, what would you give to be a young man again? Listen to this young man, saving $50,000 a year," and they both had a good-hearted laugh over it. However, Mr Bennett, with his usual confidence in the men under him, approved the plan, authorized our designing automatic feeds—and, after several years of experimental work and very costly building of the automatic feeds, all of our shot shell machines were so equipped.

'This development of automatic feeds again brought attention to automatic shell feeds, and we continued to develop automatic feeds for our various machines, notably in the Paper Shot Shell Department, and in time we developed automatic paper shot shell feeds, which were used in our shot shell headers, our shot shell primers and our other machines.

'When we were saving an amount which I estimated at $200,000 a year, I had great pleasure in going to Mr

***At left:* The Winchester Colt Commemorative set, honoring two guns that tamed the Wild West. The receiver of this Winchester Model 94 features a portrait of Oliver F Winchester etched in gold.**

Bennett and calling his attention to the fact that he had laughed at me when I said we could save $50,000 a year, and that I now estimated we were saving in excess of $200,000 a year as a result of my two-hour visit to the UMC loading room.'

One problem connected with shot shell manufacture involved the purchase and storage of shot. Prior to 1912, Winchester purchased its shot from outside concerns. Shot was shipped in cloth bags weighing 25 pounds each. These had to be carefully stored and handled to prevent the bags from bursting. Adding to the complexity of shot-handling operations in those days was that, during the course of production, the Company had to handle a large variety of shot sizes.

Because the demand for particular sizes varied from season to season, it was not possible to purchase the required amounts until orders began to come in, without running the danger of building shot inventories beyond current needs. Also—if, for any reason, the required shot failed to arrive by the time it was needed, production schedules were seriously disrupted.

In spite of these difficulties, the Company took no steps to produce its own shot until 1911. In that year, the National Lead Company—which had been Winchester's own source of shot—purchased the US Cartridge Company, and thereby became a direct competitor with Winchester in the ammunition field.

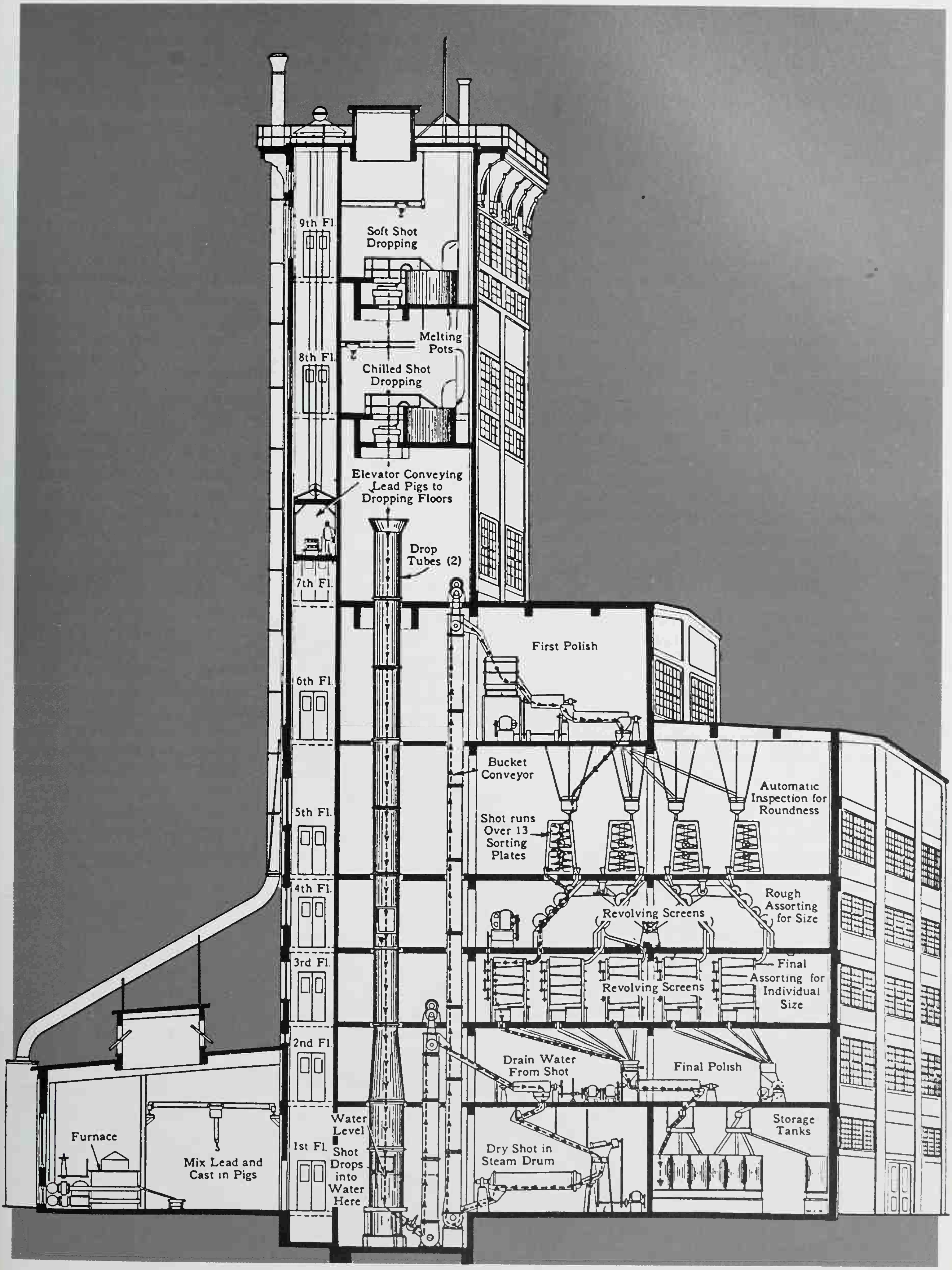
Winchester management was unwilling to have its principal source of shot in the hands of a competitor, and immediately started to build its own shot tower in New Haven. The structure was completed in 1912, at a total cost of $190,000. The tower was nine stories high, and the equipment used was of the latest design and was almost completely automatic.

Conveyors carried the lead to the top floor, where it was melted, poured into sieves to give the required sizes and dropped into a water tank 154 feet below. Sorting, polishing, sizing and inspection were all done mechanically, without the shot being handled by workman. A duplicate set of machinery guarded against a breakdown, and an average of about 50 tons of shot could be produced in a day's operations.

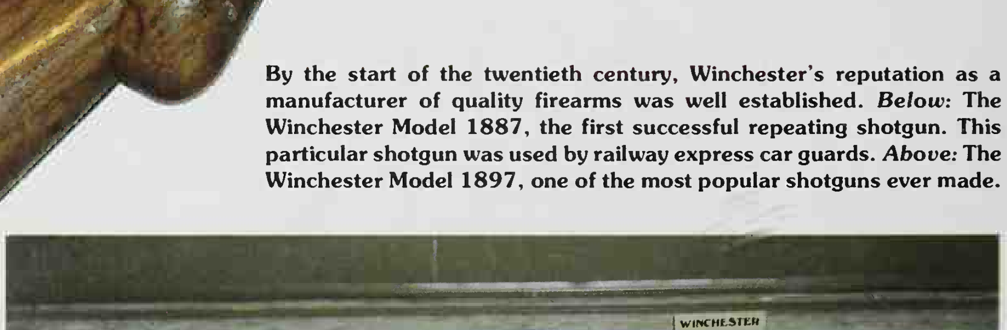
Located close to the shot shell loading rooms, the use of the shot tower greatly simplified Winchester's manufacturing problems. Shot was ordered to be made at the tower in the sizes and amounts needed by the loading room, and was, upon production, transferred directly without the necessity of storage and extra handling. Inventories now kept track of easily-handled lead 'pigs.'

By 1914, Winchester management could look upon its ammunition development with considerable satisfaction. The problems brought about by the introduction of smokeless powder and the expansion of factory loading had been met and brought under control, an impressive list of new cartridges and shot-shell loads had been added to the line, and the addition of the shot tower had further integrated Winchester's ammunition manufacturing processes.

***Below:* The Model 9422 Commemorative Rifle—complete with its own .22 caliber ammunition—honors the Boy Scouts of America. *At right:* The Winchester Shot Tower, which was completed in 1912.**


9th Fl.
Soft Shot Dropping
Melting Pots
8th Fl.
Chilled Shot Dropping
Elevator Conveying Lead Pigs to Dropping Floors
Drop Tubes (2)
7th Fl.
First Polish
6th Fl.
Bucket Conveyor
Automatic Inspection for Roundness
5th Fl.
Shot runs Over 13 Sorting Plates
4th Fl.
Revolving Screens
Rough Assorting for Size
3rd Fl.
Revolving Screens
Final Assorting for Individual Size
2nd Fl.
Drain Water From Shot
Final Polish
1st Fl.
Water Level
Shot Drops into Water Here
Dry Shot in Steam Drum
Storage Tanks
Furnace
Mix Lead and Cast in Pigs

The Company Twentieth



By the start of the twentieth century, Winchester's reputation as a manufacturer of quality firearms was well established. *Below:* The Winchester Model 1887, the first successful repeating shotgun. This particular shotgun was used by railway express car guards. *Above:* The Winchester Model 1897, one of the most popular shotguns ever made.

Enters the Century

The 20-year period surrounding the turn of the century was marked by level prices, reflecting a generally stable business atmosphere. This stability was exemplified by Winchester's price list, which had only the most minor changes—most of these additions or deletions to the catalogue—over a period of 24 years. The company prospered, and many new products entered the line, including the Winchester Pump Action; the Model 1890 Rimfire; the Model 92 Center Fire Lever Action; the Model 94, the first Winchester designed for smokeless powder; the Model 97 Pump Shotgun; the Model 1898 Breech Loading Saluting Cannon; the Model 03, the first really successful American semiautomatic and the Model 12.

In 1916, John Edward Otterson was elected as the first Vice President and General Superintendent of Winchester, becoming the first company head who was not a member of the Winchester family. With war impending in Europe, a vast expansion of the old Winchester plant was undertaken to fulfill the war contracts. Winchester became the supplier of Enfields to the British army, eventually delivering over a half million rifles and bayonets to the Western front. When America entered the war in 1917, the company switched to manufacturing arms for the US Army. More than 50,000 Browning Automatic Rifles and several hundred million rounds of ammunition were sold.

During World War I, the short barreled version of the Winchester Model 97 shotgun (widely known as a 'riot gun') was used by the American troops as a trench gun. Groups of American soldiers that were especially skilled at trap shooting were armed with these guns and stationed where they could fire at any hand grenades thrown and thus deflect them from falling into the American trenches.

The Americans generally fired .34 caliber buck shot in their shotguns, each load consisting of six shot pellets. They also employed these guns against German soldiers, and the ensuing German casualties prompted the German government to contact Secretary of State Lansing on 14 September 1918 and protest the use of the shotguns by the American Army, calling attention to the fact that according to the laws of war every prisoner found to have in his possession such guns or ammunition would immediately forfeit his life.

The passage in the Hague Decrees alluded to in the German protest refers to the use of arms calculated to cause 'unnecessary' suffering. The American reply noted that the shotguns did not fall under the Hague ban and that if the Germans carried out their death threat 'in a single instance' the United States Government knew what to do in the way of reprisals and gave notice of its intention to carry them out.

The Americans continued their grisly work, and by November 1918 two more models (the Winchester Hammerless and the Remington) were scheduled to be brought into production when Germany suddenly surrendered. The author's own grandfather was one of these shotgun-toting Dough Boys and remembers him recounting stories of this period.

Employment at Winchester rose to more than 15,000 during the war, the highest it would ever be, but several things went wrong during this period. Prices had been stable for almost 25 years and had lulled the company into signing long term fixed price contracts just as wages and costs of goods were making dramatic upward trends. The expansion of the plant had been carried on haphazardly and new buildings had been erected among the old ones. Instead of increasing efficiency, the expansion had decreased efficiency

Above: **The Model 1903 Rifle, chambered for the company's new smokeless .22 caliber automatic rimfire cartridge.** ***At right:*** **The Model 90. This rimfire, pump action rifle was widely used for small game and target shooting.** ***Below:*** **The Winchester plant in 1914—and in 1919 (below right), after the expansion.**

by making it impossible to consolidate operations into the new buildings because they were so spread out.

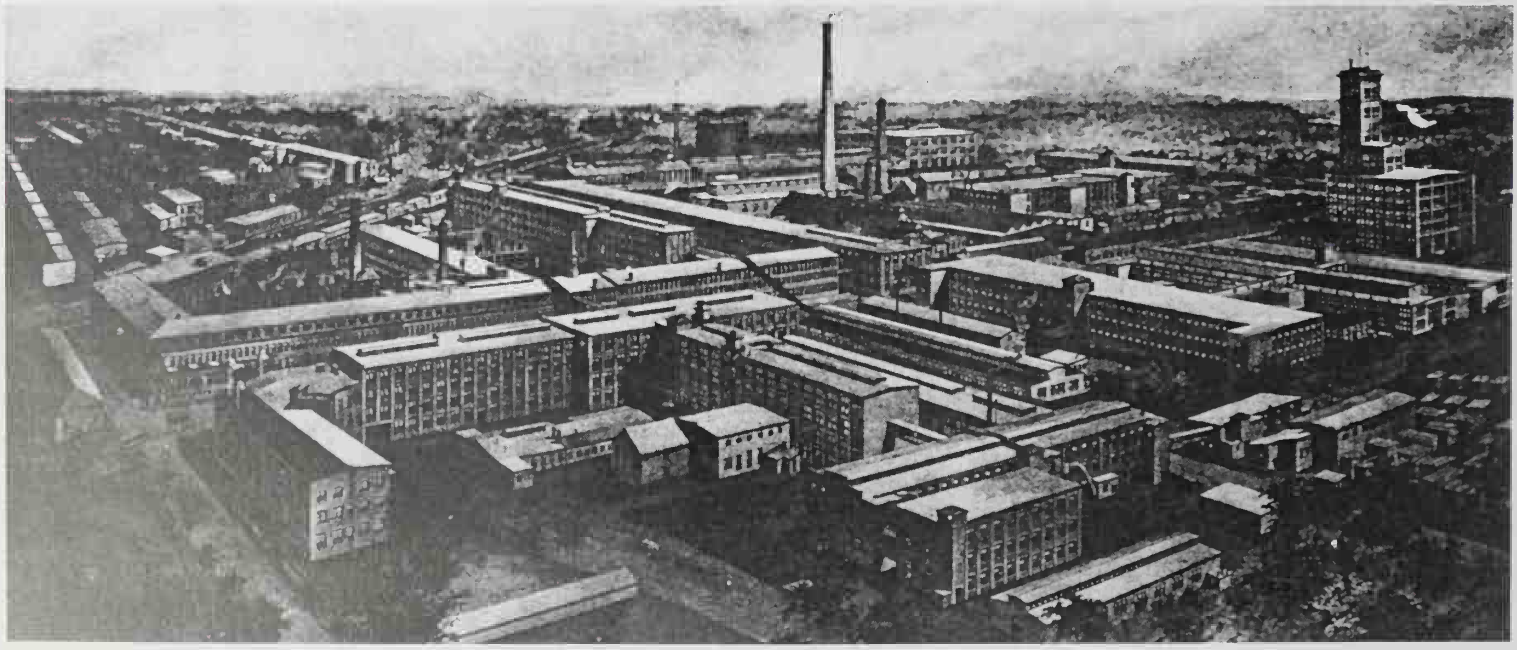
At the end of the war, contracts were cancelled—this idled large portions of the plant principally because sales of sporting arms lagged. But the biggest worry in 1919 was the amount of income tax the company would have to pay for its war years profits. Estimations of the amount of tax actually owed ranged from 18 to 80 percent, and this caused so much concern in management that, in order to be prepared to pay the tax and still leave enough money for 'new projects,' Winchester borrowed $3 million from Kidder Peabody.

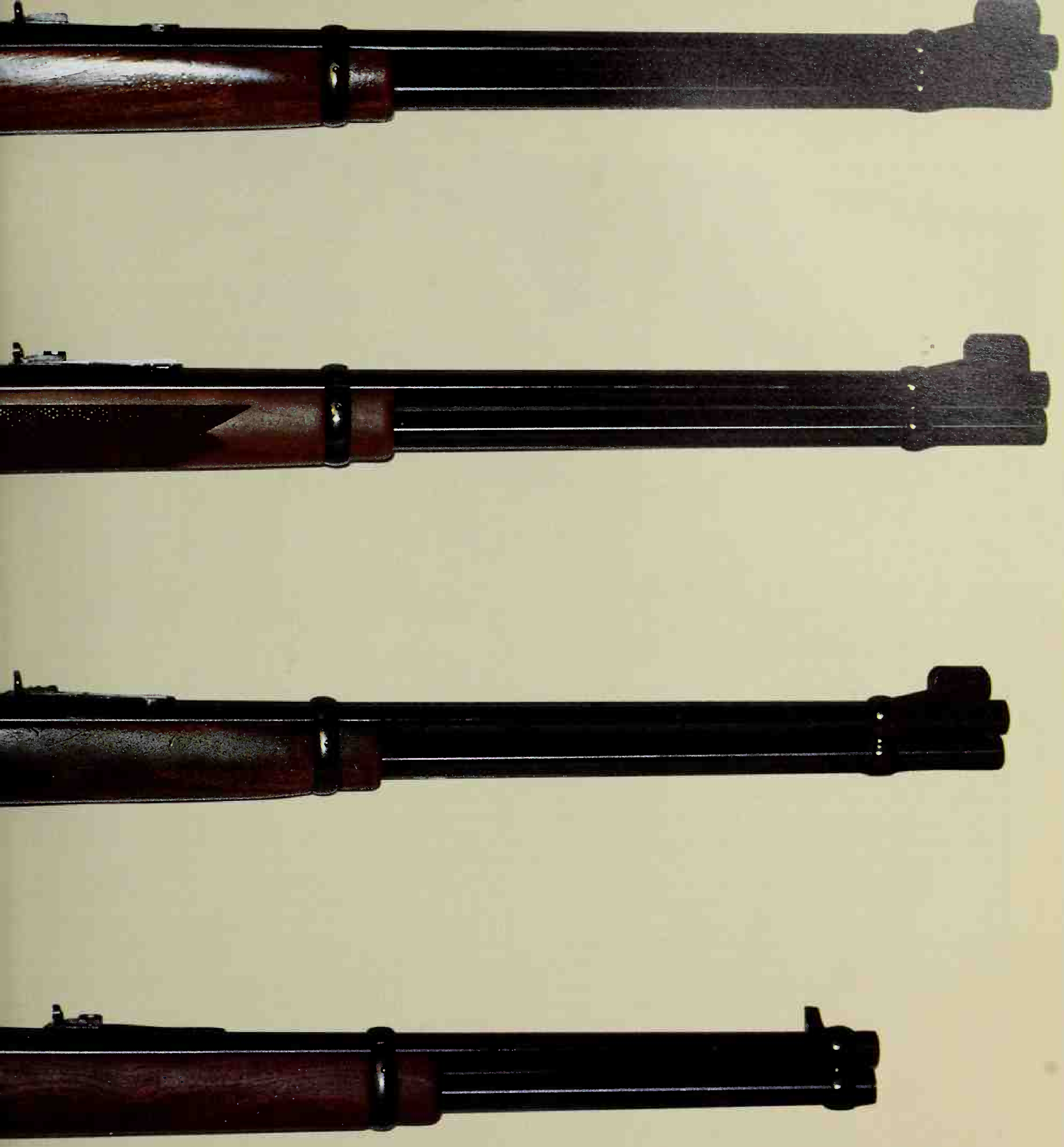
This last sum was in addition to a loan of $16 million the company had borrowed to finance the recent expansion, of which only $8 million had been paid off. Even when the income tax problem was resolved with the payment of $3.14 million to the government, the arms and ammunition business was deemed too small to pay off the remaining indebtedness—which now stood at about $17 million dollars total. Therefore, an agreement between the stockholders, Kidder Peabody, Otterson and Louis K Liggett to reorganize the company and expand into new areas was signed.

Mr Liggett was the founder and President of the United Drug Company and had made millions of dollars organizing the first nationwide chain of drug stores and supplying them with his own brands of merchandise under the trade name of Rexall. Kidder Peabody thought very highly of him and considered the Winchester resurrection possible only if he were directly involved in the planning and operation of the new experiment.

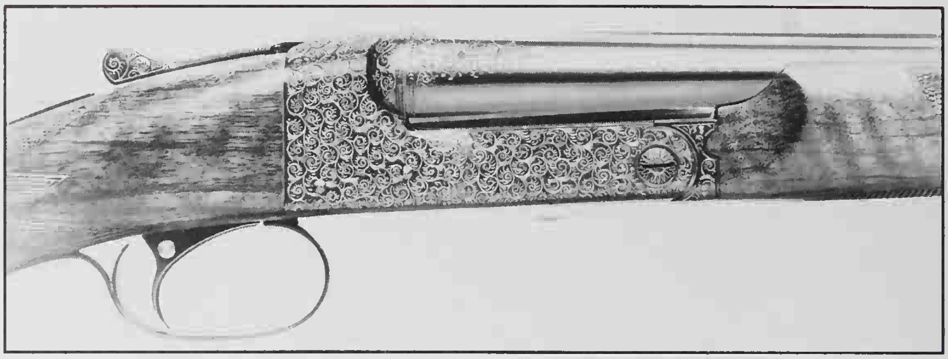
In early 1920, the Winchester Company was organized with JE Otterson as President and was divided into two divisions—The Winchester Repeating Arms Company, manufacturer of the firearms and ammunition, and the Winchester Company, which was to establish a chain of Winchester dealer agents and open Winchester retail stores that would sell all of the new Winchester line of home hardware.

This new hardware product line, usually manufactured at the arms plant, included knives, cutlery, fishing equipment, hand tools, skis, wrenches, batteries, flashlights, carpenter tools, ice skates, roller skates, paint, varnish, brushes, baseball bats, athletic equipment, kitchen appliances, washing machines, and the Ice-O-Later gas refrigerator. This major





The most famous of the Winchester line—the Model 94. Although similar in external appearance to the Model 92, this gun differed from previous models in that it was the first sporting repeating rifle adapted for the smokeless cartridge. The Model 94 was especially popular in the West, where it quickly became standard equipment for settlers, hunters and ranchers. *Above, from top to bottom:* The Model 94 .32 Special Rifle, the Model 94 .357 Caliber Big Bore, the Model 94 .30-30 Caliber and the Model 94 Trapper Special .30-30 Caliber.



At top: **The Model 21 Field Gun.** ***Above:*** **The intricately engraved receiver of the Model 21 Grand American.** ***At bottom:*** **The Model 54.** ***Opposite:*** **In the 1920s, Winchester ventured into other product lines.**

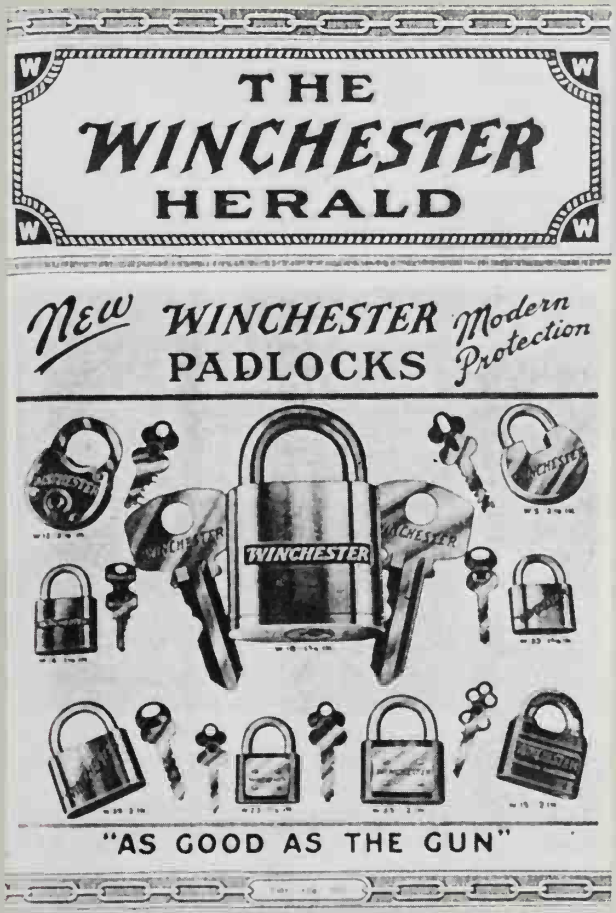
expansion into areas that were unfamiliar to the management and technical staffs appears to have been doomed from the very start. In order to buy expertise, hardware manufacturing companies were purchased, but this strategy generally failed because the only companies that were willing to sell out were usually weak and noncompetitive or possessing only obsolete product lines.

As Winchester's acquisitions and expansions roared into the 1920s, their debt service became staggering. Sales of all hardware product lines began to lag and costs continued to run uncontrolled, making all, or nearly all, of the lines more expensive than their respective competitions. Substantial pressure to give special concessions to in-house sales further aggravated the cash flow situation of the company. All available resources were being used to keep the hardware business afloat and keep the numerous creditor wolves from the door.

During this period, arms and ammunition profits continued to perform well; however, a lack of investment in design and production facilities or equipment was beginning to show in declining sales and increasing costs. Despite the lack of attention from management, the engineering departments were continuing to design and produce some fine new arms. The Model 52 rimfire rifle in 1920 and the Model 54 in 1924 were the first successful bolt action rifles produced by Winchester.

With only a minor redesign and facelift, the Model 54 became the Model 70 in 1937. The Model 21 made its debut in 1931. However, firearms sales were not enough to keep the sinking ship afloat and by February of 1929 the Winchester Company was dissolved and a new company, The Winchester Repeating Arms Company of Delaware, took over all the old obligations of the old company.

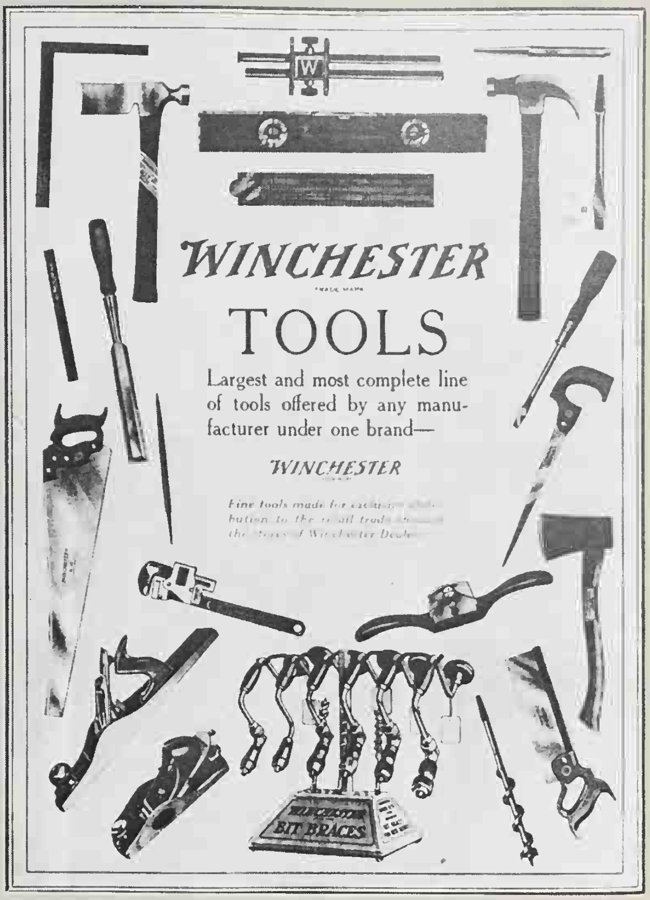
The dealer agents were disbanded and all products were to be sold on the open market. Within two years, the debt service had become totally debilitating at nearly a million dollars a year, and the company was propelled into bankruptcy on 21 January 1931. Winchester had gone down with the Great Depression. It was to rise again less than one year later on the shoulders of the Western Cartridge Company, which acquired it on 22 December 1931.



THE
WINCHESTER
HERALD

New WINCHESTER PADLOCKS Modern Protection

"AS GOOD AS THE GUN"



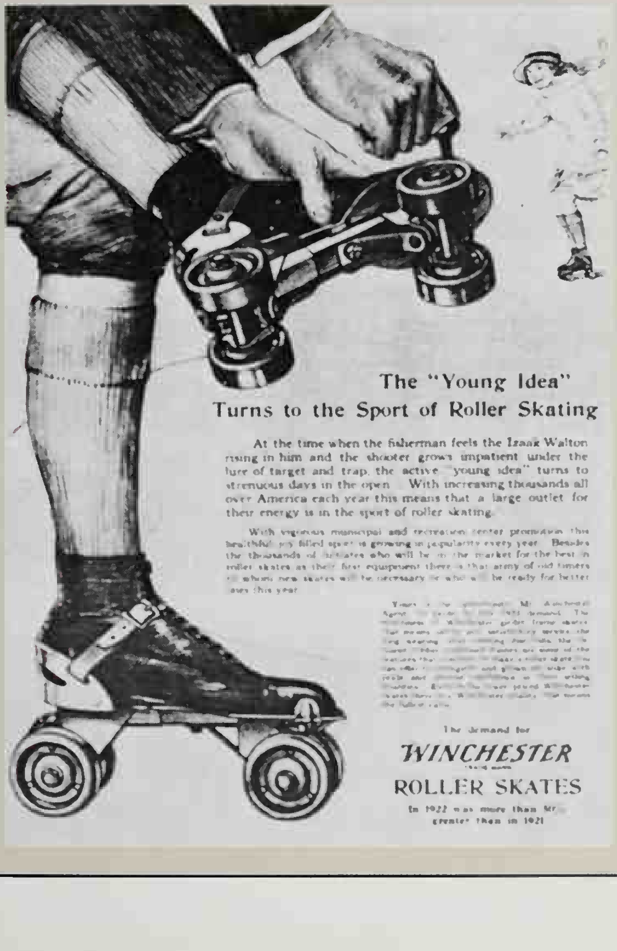
WINCHESTER
TRADE MARK
TOOLS

Largest and most complete line of tools offered by any manufacturer under one brand—

WINCHESTER

Fine tools made for exclusive distribution to the retail trade through the Stores of Winchester Dealers

WINCHESTER BIT BRACES



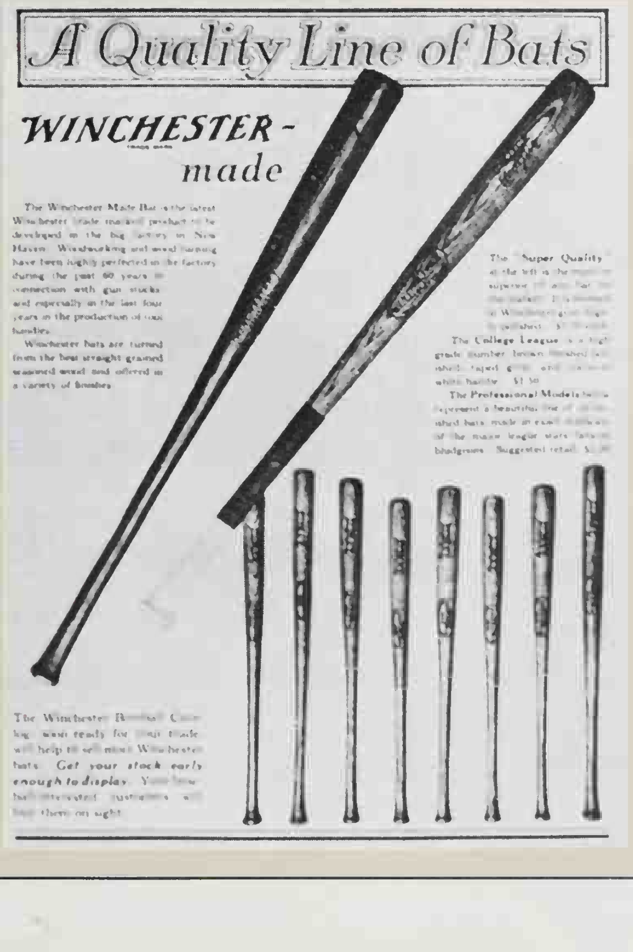
The "Young Idea"
Turns to the Sport of Roller Skating

At the time when the fisherman feels the Izaak Walton rising in him and the shooter grows impatient under the lure of target and trap, the active "young idea" turns to strenuous days in the open. With increasing thousands all over America each year this means that a large outlet for their energy is in the sport of roller skating.

With vigorous municipal and recreation center promotion this healthful joy filled sport is growing in popularity every year. Besides the thousands of beginners who will be in the market for the best in roller skates as their first equipment there is that army of old timers to whom new skates will be necessary or who will be ready for better ones this year.

[illegible]

The demand for
WINCHESTER
TRADE MARK
ROLLER SKATES
in 1922 was more than [illegible]
greater than in 1921



A Quality Line of Bats

WINCHESTER-
TRADE MARK
made

The Winchester Made Bat is the latest Winchester trade marked product to be developed in the big factory in New Haven. Woodworking and wood turning have been highly perfected in the factory during the past 60 years in connection with gun stocks and especially in the last four years in the production of our handles.

Winchester bats are turned from the best straight grained seasoned wood and offered in a variety of finishes.

The "Super Quality" at the left is the [illegible]

The College League is a high grade number brown finished [illegible] white handle. $1.50

The Professional Models [illegible] represent a beautiful line of [illegible] bats made in exact [illegible] of the major league stars [illegible] bludgeons. Suggested retail $[illegible]

The Winchester Baseball Catalog now ready for your trade will help to sell more Winchester bats. *Get your stock early enough to display.* Your [illegible] interested customers will [illegible] them on sight.

The Cartridge

The Western Cartridge Company had its roots in Franklin W Olin, who founded, in 1892, the Equitable Powder Manufacturing Company of East Alton, Illinois. Initially that company had produced black powder for use in southern Illinois coal mines, but by 1894 had switched its emphasis to production of 'sporting powder' for ammunition. Aware of the growing popularity of factory loaded ammunition, Olin began work on a machine that would load shotgun shells and this invention established the Western Cartridge Company.

Olin believed in 'hands on' involvement in the important elements of developing the company's various product lines and Western's reputation for manufacturing quality products grew until, by the turn of the century, it was a major force in the ammunition business. The reliability of its ammunition earned the Western Cartridge Company commendations from the US and Allied governments during World War I.

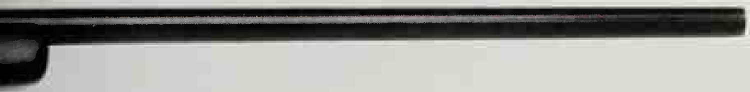
Franklin Olin was succeeded by his son, John, who himself was gifted with an inventive mind. Young John shared his father's interest in the technical side of the business, and his interests in the development of smokeless powder for commercial use resulted in the introduction of Western's Super-X ammunition, which is still available today. The demand for these Super-X shells was so great among hunters and sportsmen that the Western Cartridge Company soon rose to a position of absolute dominance in the ammunition industry.

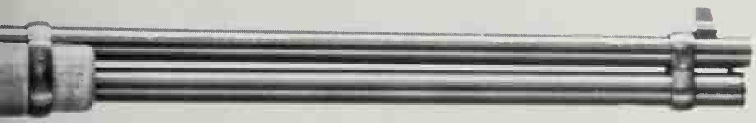
With the purchase of Winchester, the Winchester-Western Company became the largest owner of patents on ammunition and firearms in the world. Relying on the same innovative spirit that started the company, John Olin took an active interest in the development of the ammunition and firearms now produced by Winchester. By 1940, Winchester-Western had introduced 23 new guns to its line and was in a solid position to serve the country once more as World War II approached. By that war's end the company had produced more than 15 billion rounds of ammunition and 1.5 million military arms.

Following the war, Winchester-Western continued to remain on the leading edge of ammunition technology, with a list of innovative firsts that included Ball Powder propellant in 1946, the Baby Magnum shotshell in 1954, the .22 Winchester Magnum Rimfire cartridge in 1959, the Mark 5 shotshell in 1962, the Compression-Formed plastic shotshell in 1964, the Double A target load in 1965, the Super Double X 10 gauge shotshell in 1968, the Silvertip hollow-point load in 1979 and the Super-X 10 gauge Magnum steel shot load in 1982.

Western Company

Introduced in 1924, the Model 54 Rifle *(above)* marked Winchester's entry into the heavy caliber, bolt action field. In 1980, Winchester introduced the Model 23 Shotgun *(below)*, which is manufactured by a subsidiary in Japan. It was the first side-by-side shotgun produced by Winchester in 20 years.





At top and bottom: Two views of the Model 1912 Shotgun. Priced at $20, this gun was an immediate best seller. General Curtis E LeMay *(above)* fires his Model 1912 Trap Gun. *Center, above and below:* The Model 70 Magnum Bolt Action Center Fire Rifle—and the Model 94 Ranger Carbine with Bushnell Sportview 4X scope and see-through mounts.

Winchester

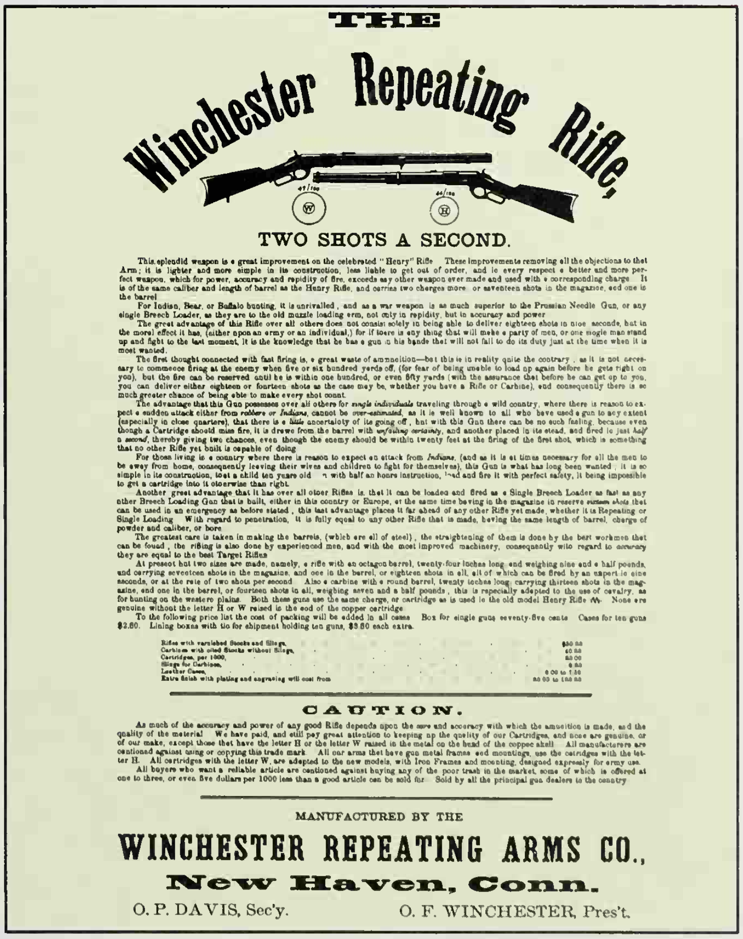
From the days of the Winchester Repeating Arms Company's Repeating Rifle manufactured by (as seen in the advertisement *at right*), to the present, Winchester firearms have consistently ranked among the best in the world. The Winchester Model 9422 .22 Caliber Rifle *(above)* typifies modern day gun making at its finest.

Today

In August 1954, Olin merged with Mattheson Chemcal Corporation to form Olin Mattheson, one of America's largest industrial complexes. In December 1980, Olin's board of directors authorized the disposal of the company's Winchester Sporting Arms business in the United States, and on 20 July 1981 Winchester was sold to the US Repeating Arms Company, which was actually a group of former employees, investors and bankers. Today the firm, though currently under bankruptcy court protection, is still making the famed Winchester rifles under a license from Olin. (It is interesting to note that in January of 1988 Browning acquired 37 percent interest in Winchester arms.)

Olin's Winchester Operations branch continues to manufacture sporting and defense ammunition and market its Japanese-produced line of high-quality over-and-under and side-by-side shotguns. The worldwide operations of today's Winchester include headquarters and an ammunition manufacturing plant (complimented by Olin's brass mill) in East Alton, Illinois; a ball powder propellant manufacturing plant in St Mark's, Florida; and a defense products manufacturing facility at Marion, Illinois.

Winchester operations also include the Lake City Army Ammunition Plant at Independence, Missouri; a Winchester shotshell plant at Anagni, Italy; and another ammunition plant in Australia. Olin-Kodensha (OK Firearms Company) at Tochigi, Japan produces the popular Classic Doubles line of Winchester shotguns. Whatever the future may bring, it is clear that when you load up with Winchester, you load up with a legend.



THE

Winchester Repeating Rifle,

47/100
W
44/100
H

TWO SHOTS A SECOND.

This splendid weapon is a great improvement on the celebrated "Henry" Rifle These improvements removing all the objections to that Arm; it is lighter and more simple in its construction, less liable to get out of order, and in every respect a better and more perfect weapon, which for power, accuracy and rapidity of fire, exceeds any other weapon ever made and used with a corresponding charge It is of the same caliber and length of barrel as the Henry Rifle, and carries two charges more or seventeen shots in the magazine, and one in the barrel

For Indian, Bear, or Buffalo hunting, it is unrivalled, and as a war weapon is as much superior to the Prussian Needle Gun, or any single Breech Loader, as they are to the old muzzle loading arm, not only in rapidity, but in accuracy and power

The great advantage of this Rifle over all others does not consist solely in being able to deliver eighteen shots in nine seconds, but in the moral effect it has, (either upon an army or an individual,) for if there is any thing that will make a party of men, or one single man stand up and fight to the last moment, it is the knowledge that he has a gun in his hands that will not fail to do its duty just at the time when it is most wanted.

The first thought connected with fast firing is, a great waste of ammunition—but this is in reality quite the contrary, as it is not necessary to commence firing at the enemy when five or six hundred yards off, (for fear of being unable to load up again before he gets right on you), but the fire can be reserved until he is within one hundred, or even fifty yards (with the assurance that before he can get up to you, you can deliver either eighteen or fourteen shots as the case may be, whether you have a Rifle or Carbine), and consequently there is so much greater chance of being able to make every shot count.

The advantage that this Gun possesses over all others for *single individuals* traveling through a wild country, where there is reason to expect a sudden attack either from *robbers or Indians*, cannot be *over-estimated*, as it is well known to all who have used a gun to any extent (especially in close quarters), that there is a *little* uncertainty of its going off, but with this Gun there can be no such feeling, because even though a Cartridge should miss fire, it is drawn from the barrel with *unfailing certainty*, and another placed in its stead, and fired in just *half a second*, thereby giving two chances, even though the enemy should be within twenty feet at the firing of the first shot, which is something that no other Rifle yet built is capable of doing

For those living in a country where there is reason to expect an attack from *Indians*, (and as it is at times necessary for all the men to be away from home, consequently leaving their wives and children to fight for themselves), this Gun is what has long been wanted, it is so simple in its construction, that a child ten years old n with half an hours instruction, load and fire it with perfect safety, it being impossible to get a cartridge into it otherwise than right.

Another great advantage that it has over all other Rifles is, that it can be loaded and fired as a Single Breech Loader as fast as any other Breech Loading Gun that is built, either in this country or Europe, at the same time having in the magazine in reserve *sixteen shots* that can be used in an emergency as before stated, this last advantage places it far ahead of any other Rifle yet made, whether it is Repeating or Single Loading With regard to penetration, it is fully equal to any other Rifle that is made, having the same length of barrel, charge of powder and caliber, or bore

The greatest care is taken in making the barrels, (which are all of steel), the straightening of them is done by the best workmen that can be found, the rifling is also done by experienced men, and with the most improved machinery, consequently with regard to *accuracy* they are equal to the best Target Rifles

At present but two sizes are made, namely, a rifle with an octagon barrel, twenty-four inches long and weighing nine and a half pounds, and carrying seventeen shots in the magazine, and one in the barrel, or eighteen shots in all, all of which can be fired by an expert in nine seconds, or at the rate of two shots per second Also a carbine with a round barrel, twenty inches long, carrying thirteen shots in the magazine, and one in the barrel, or fourteen shots in all, weighing seven and a half pounds, this is especially adapted to the use of cavalry, as for hunting on the western plains. Both these guns use the same charge, or cartridge as is used in the old model Henry Rifle. None are genuine without the letter H or W raised in the end of the copper cartridge

To the following price list the cost of packing will be added in all cases Box for single guns seventy-five cents Cases for ten guns $2.60. Lining boxes with tin for shipment holding ten guns, $3.60 each extra.

Rifles with varnished Stocks and Slings,	$50 00
Carbines with oiled Stocks without Slings,	40 00
Cartridges, per 1000,	[illegible]
Slings for Carbines,	[illegible]
Leather Cases,	[illegible] to [illegible]
Extra finish with plating and engraving will cost from	[illegible] to [illegible]

CAUTION.

As much of the accuracy and power of any good Rifle depends upon the care and accuracy with which the ammunition is made, and the quality of the material We have paid, and still pay great attention to keeping up the quality of our Cartridges, and none are genuine, or of our make, except those that have the letter H or the letter W raised in the metal on the head of the copper shell All manufacturers are cautioned against using or copying this trade mark. All our arms that have gun metal frames and mountings, use the cartridges with the letter H. All cartridges with the letter W, are adapted to the new models, with Iron Frames and mounting, designed expressly for army use.

All buyers who want a reliable article are cautioned against buying any of the poor trash in the market, some of which is offered at one to three, or even five dollars per 1000 less than a good article can be sold for Sold by all the principal gun dealers in the country

MANUFACTURED BY THE

WINCHESTER REPEATING ARMS CO.,

New Haven, Conn.

O. P. DAVIS, Sec'y. O. F. WINCHESTER, Pres't.

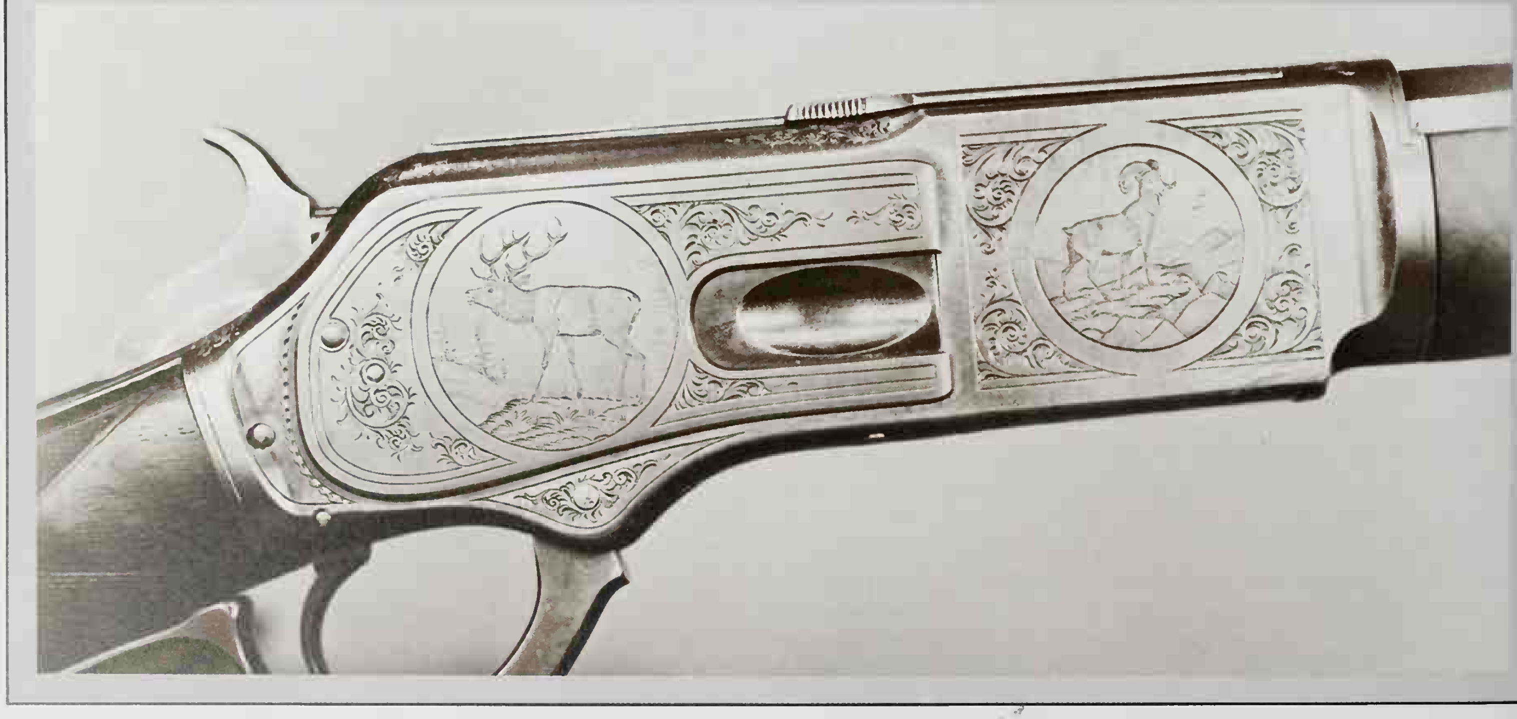
Theodore Roosevelt

Theodore Roosevelt was born in New York on 27 October 1858. By the time he graduated from Harvard in 1880, he had become both an excellent boxer and an avid sportsman. In 1884, he became a rancher in North Dakota, where he served as a local deputy sheriff. Roosevelt captured these western experiences in his book *Hunting Trips of a Ranchman*, which was published in 1885. It was in this volume that he first expressed his enthusiasm for Winchester rifles.

The Sharps and English Express rifles of his time were noted for their vicious recoil, but when Teddy came into contact with a .45-75 Winchester Model 76 Half Magazine, his lifelong love affair with Winchesters was born. The Model 76 was a pleasure to shoot, it was accurate and handy, and was quite equal to any kind of hunting to be found in North America. In short order, Teddy also acquired a .44 caliber WCF Winchester Model 73, a .45-75 caliber WCF Winchester Model 76, and a Hammerless Top Lever Breechloading Double Shotgun.

When Roosevelt's Rough Riders went to Cuba during the Spanish-American War, Teddy brought along his .30 caliber Winchester Model 95. His exploits as Colonel Roosevelt of the Rough Riders brought him such notoriety that in 1898 he was elected Governor of New York. Roosevelt was elected Vice President of the United States under President McKinley in 1901 and became the 26th President of the United States when the latter was assassinated. He served the remainder of McKinley's term and was returned to the presidency in 1904 by a large majority.

It was during his last year in office that Roosevelt began extensive preparations for his now famous African trip with his son, Kermit, to gather specimens for the Smithsonian Institution. Naturally Teddy wanted to use Winchester rifles and ammunition on the hunt, and so entered into extensive correspondence with the Winchester Company to procure weapons to his exacting specifications.



WINCHESTER
THEODORE ROOSEVELT

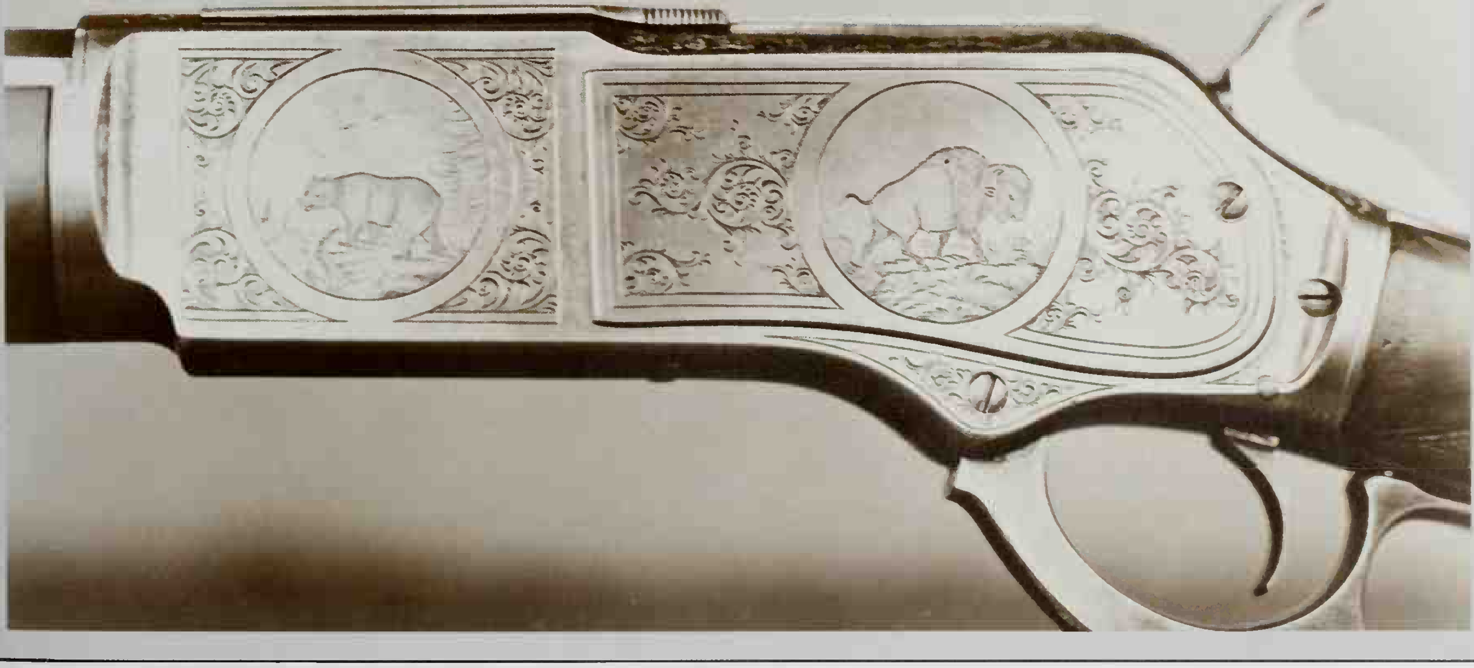
In his many letters to Winchester, Teddy showed himself to be both impersonal and difficult to please. He became very upset over the way the guns were first made even though he was himself chiefly responsible for the confusion. The management of Winchester, however, saw the inestimable worth of having the President of the United States use their weapons in such a public setting, and so handled the matter with both tact and diplomacy by sparing no effort to give Roosevelt exactly what he wanted.

Teddy's initial choice of weapons was as follows: a .30-40 caliber Model 95, two .405 caliber Model 95s and a .45-70 caliber Model 86. After considerable discussion, it was decided that the company would supply two .405 caliber Model 95 rifles and one .30 caliber Model 95, chambered for the US Government ammunition, as well as all of the ammunition needed for the trip.

The President's great African hunting trip began on 23 March 1909 when he, his son Kermit and a group of naturalists sailed from New York for Mombasa, British East Africa. The party landed in April of that year and spent the next 11 months hunting wild animals. They sent back to the United States a total of 4897 mammals, more than 4000 birds, 2000 reptiles and approximately 500 fishes, besides numerous other specimens. Accounts of the trip written by Roosevelt ran in *Scribner's Magazine* during the years 1909 and 1910 and were later incorporated into his book entitled *African Game Trails*.

Teddy lavishly praised his Winchester weapons in all of these accounts, and Winchester lavishly quoted him in their advertising campaigns. One example read 'Tarlton took his big double-barrel and advised me to take mine as the sun had just set and it was likely to be close work; but I shook my head, for the Winchester .405 is, at least for me personally, the "medicine gun" for lions.'

Far left: Theodore Roosevelt the hunter, in 1883 with his Model 1876. _At bottom:_ Two views of Roosevelt's finely engraved Model 1876 in .40-60 caliber. _At above left:_ 'Teddy' and his hunting companions Wilmont Dow (photo left) and Bill Sewell (photo right). _Left, center:_ The Winchester ammunition wagon for Roosevelt's famed African Safari.



'Buffalo Bill' Cody

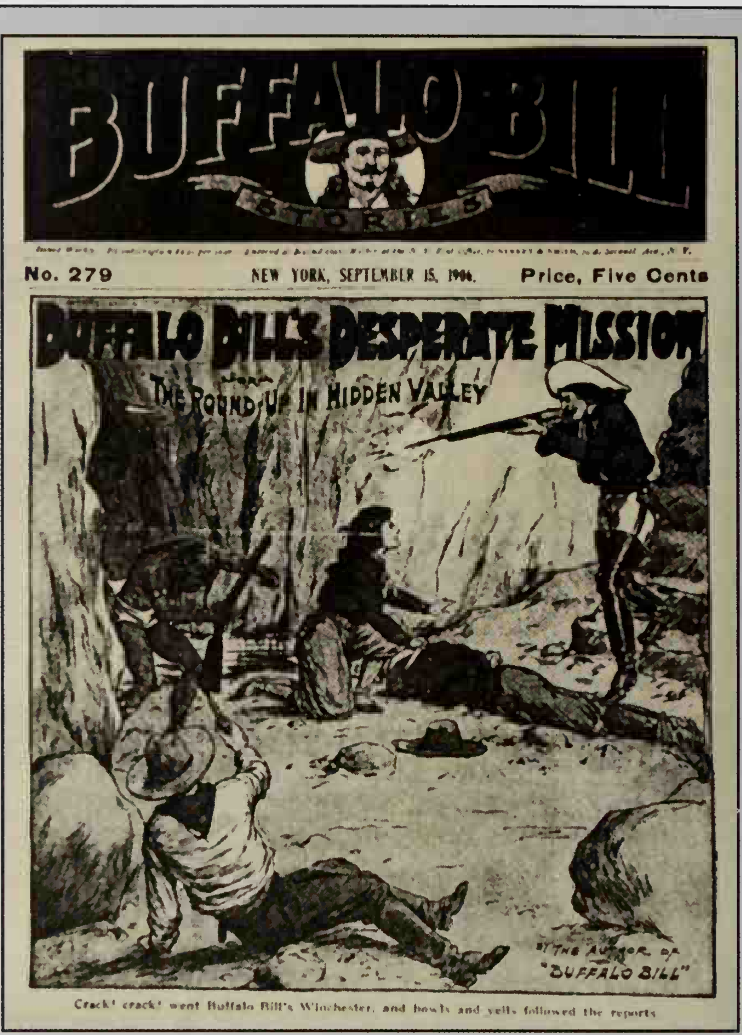
William Frederick Cody promoted himself into the ranks of such legendary Americans as Kit Carson, Daniel Boone, Jim Bridger and 'Wild Bill' Hickok. He was both a superb rider and marksman and, between 1872 and 1916, he recreated the atmosphere of the American West before European and American audiences principally through his now famous Wild West Show.

Cody was never employed by the Winchester company to publicize its products, but Winchesters were associated with him and many of his fellow marksmen in the Wild West Show from the very beginning. Cody was featured in over 200 'nickel novels' (the forerunners to modern comic books) and, either directly or indirectly, was always associated with Winchester firearms, as is evidenced by the following quote from one of those cheap thrillers. 'Buffalo Bill turned in his saddle and sent a dozen shots from his Winchester rattling back up the hill at the savages...Crack! Crack! went Buffalo Bill's Winchester, and howls and yells followed the reports.'

One of Cody's personal Winchester favorites was his smoothbore .44 Caliber Model 73 with which he used shot shells. These shells were necessary for safety reasons, because the shot would disperse and drop harmlessly within the grounds of the exhibition centers. However, this in no way detracted from Cody's marksmanship. He was known to have terrified his wife by shooting coins from between the fingers of his own children (who of course had complete confidence in their father's acumen). Winchester never failed to publicize the fact that its guns were the first choice of such star performers. This semi-elitism became the hallmark of Winchester advertising. A typical example would read:

'Look all the makes over, but if you are not swayed from your purpose of getting the gun with the maximum of strength, safety, ease and certainty, good shooting and good wearing qualities, you will surely select a Winchester. There are other makes, but the Winchester is the only one that has successfully stood every conceivable test that sportsmen could put to it, and also the rigid technical trials of the US Ordnance Board, embracing strength, accuracy, penetration, endurance, excessive loads, defective shells, rust and dust.

'Its popularity with sportsmen and its official endorsement by Government Experts are convincing proof of its reliability and wearing and shooting qualities. Stick to a Winchester and you won't get stuck!'



BUFFALO BILL STORIES

No. 279 NEW YORK, SEPTEMBER 15, 1906. Price, Five Cents

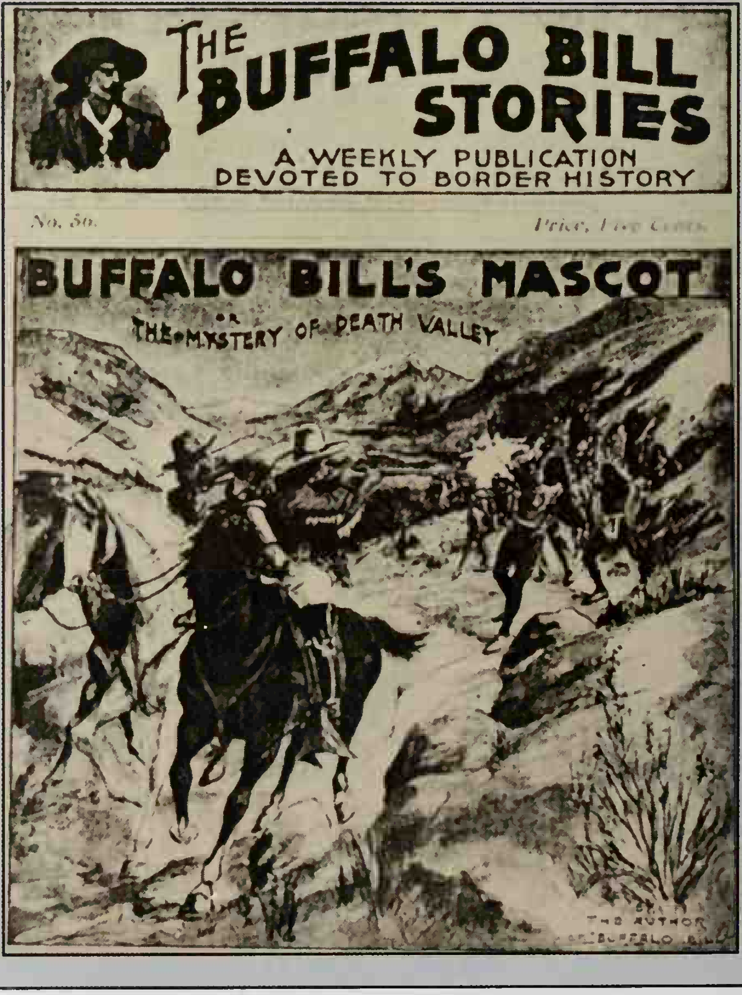
BUFFALO BILL'S DESPERATE MISSION

or

THE ROUND-UP IN HIDDEN VALLEY

BY THE AUTHOR OF "BUFFALO BILL"

Crack! crack! went Buffalo Bill's Winchester, and howls and yells followed the reports.



THE BUFFALO BILL STORIES

A WEEKLY PUBLICATION DEVOTED TO BORDER HISTORY

No. 56. Price, Five Cents

BUFFALO BILL'S MASCOT

OR

THE MYSTERY OF DEATH VALLEY

BY THE AUTHOR OF BUFFALO BILL

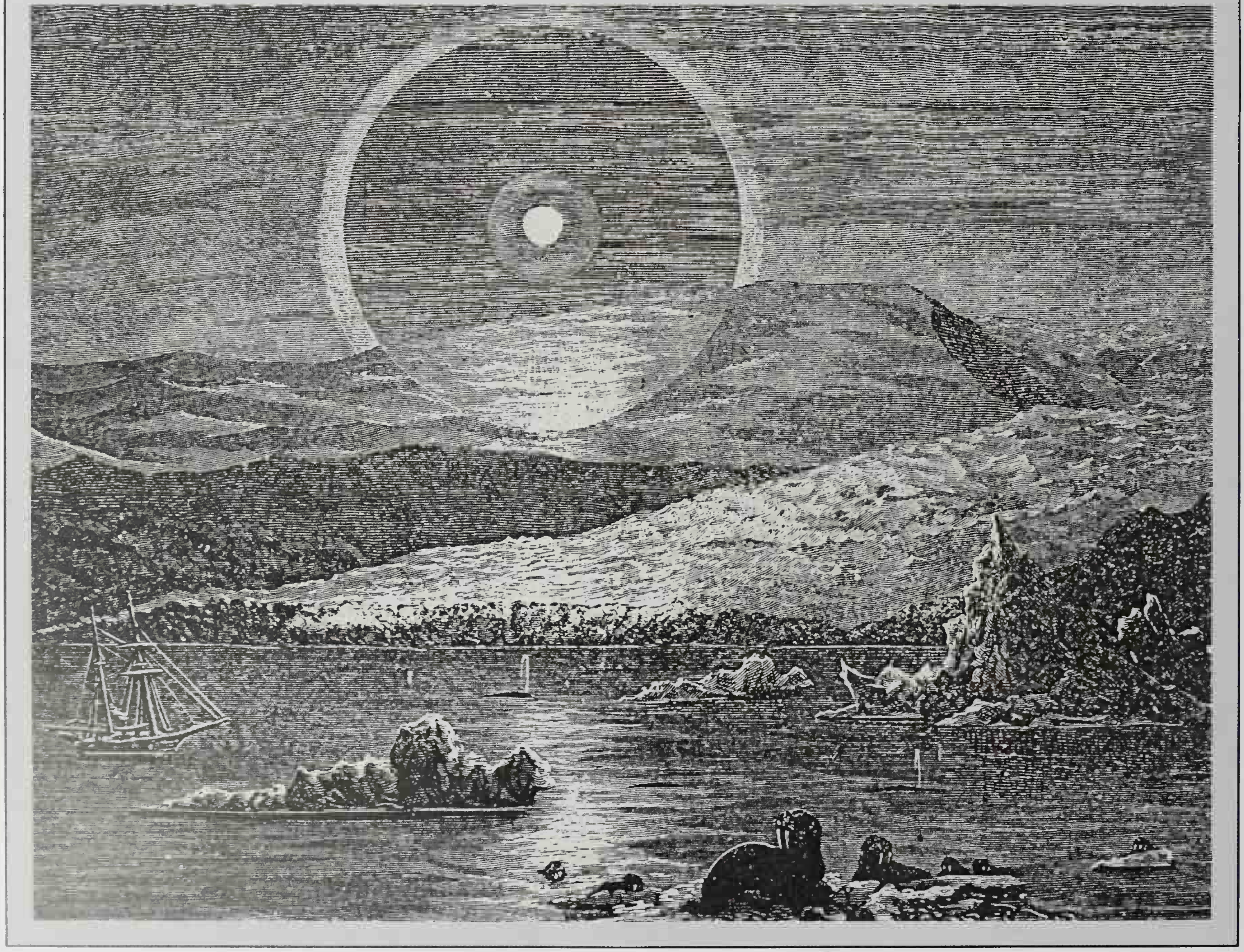
Far right: **Buffalo Bill Cody, the showman of the American frontier, did much both directly and indirectly to spread the fame of Winchester firearms. In his famous Wild West Show, he and his fellow sharpshooters—including Annie Oakley—used Winchester rifles and ammunition. As the hero of Western nickel novels** ***(at right, above and below),*** **Buffalo Bill was armed with Winchester rifles in his battles against Indians and outlaws.**

Robert Peary

Admiral Robert Peary, had long claimed to be the first man to reach the North Pole on 6 April 1909. While controversy has raged around Peary's achievement one thing is certain: he carried with him a Winchester Model 92. Advertisements such as the following were circulated by Winchester in 1909, under the heading 'The Rifle That Helped Peary Reach the North Pole.' Peary is quoted as saying—

'Personally I always carry a Winchester rifle. On my last expedition I had a Model 1892 .44 caliber Carbine, and Winchester cartridges, which I carried with me right to the North Pole. After I left the ship, I depended upon it to bring down the fresh meat that we needed. Since 1888, both in Nicaragua and in the Arctic regions, I have always used the Winchester Repeaters.

'Each of my Arctic expeditions since '91 has been fitted with these arms. The last expedition carried the .44-40 Carbine, for use on deer, seals, hare and the like, and the .40-82 for use on musk-oxen, walrus and polar bears. In facing the polar bears, in gathering a herd of musk-oxen with the least expenditure of time and priceless ammunition, and in securing the greatest number of walrus out of an infuriated herd in the least time, I desire nothing better than a Winchester Repeater.'



Adolph and 'Plinky' Topperwein

In the early 1900s, Winchester employed the son of a German gunsmith named Adolph Topperwein to represent the company as an exhibition shooter. In 1903, Topperwein married Elizabeth Servaty, who worked in the ammunition loading room at the Winchester plant at New Haven. Until she was married, Mrs Topperwein's acquaintance with shooting had not extended beyond the loading of ammunition, but she quickly proved to have an exceptional talent as a markswoman.

She set her first world's record in trap shooting in 1904 at the World's Fair in St Louis by breaking 967 clay targets out of a possible 1000 and was ever after known as 'Plinky' Topperwein. Winchester immediately arranged to have the Topperweins travel as a team, and they took their place among the world's finest shooters. The couple's feats are indeed impressive.

Plinky once 'shot trap' for a total time of five hours using a pump gun, and hit 1952 clays out of 2000 thrown. Adolph, firing a .22 caliber Winchester rifle at 2.5 inch wooden blocks tossed into the air, shot steadily, eight hours a day for 10 consecutive days, hitting a total of 72,491 blocks, missing only nine. Of the first 50,000 blocks, he missed only four, and had a number of runs of more than 10,000 without a miss, and one perfect run of 14,540.

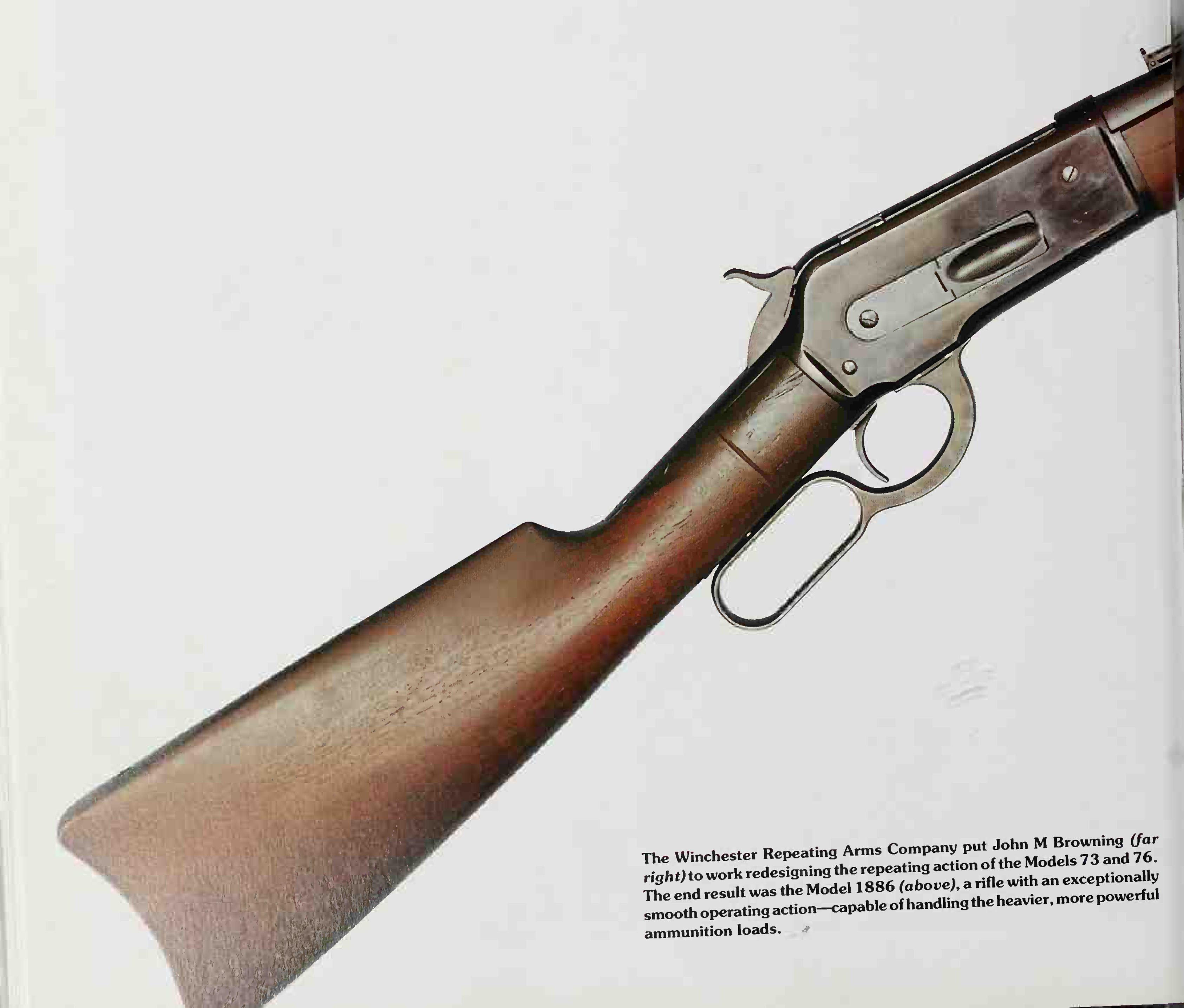
Even more amazing, Adolph specialized in targeting playing cards held edge-on at a distance, and one of his most astonishing feats involved extinguishing lighted matches that were held by assistants—by shooting backward from a prone position using a mirror to sight the target! He could also hit potatoes thrown directly toward him, break balls thrown over his head from directly behind, and break targets thrown directly in front of him.

His most famous shot was billed as never having been accomplished by any other shooter in the world. In this, he threw balls into the air and broke them, using a rifle with solid bullets while riding a bicycle at full speed. The Topperweins retired from travelling for Winchester in 1940, still retaining their status as excellent mark shooters—despite the fact that Adolph was 70 years old and his wife but a few years younger. They had done much to keep the name of Winchester before the public.

Opposite, above: **Admiral Robert Peary carried a Winchester Model 92 with him on his historic expedition to the North Pole.** ***Opposite, below:*** **The midnight sun on the horizon above the Arctic.** ***Below, left and right:*** **'Plinky' and Adolph Topperwein. For 36 years, the Topperweins represented Winchester as exhibition shooters. Their fancy shots did much to promote the Winchester name.**

Ad Topperwein

Major
Winchester



The Winchester Repeating Arms Company put John M Browning *(far right)* to work redesigning the repeating action of the Models 73 and 76. The end result was the Model 1886 *(above)*, a rifle with an exceptionally smooth operating action—capable of handling the heavier, more powerful ammunition loads.

Browning Models

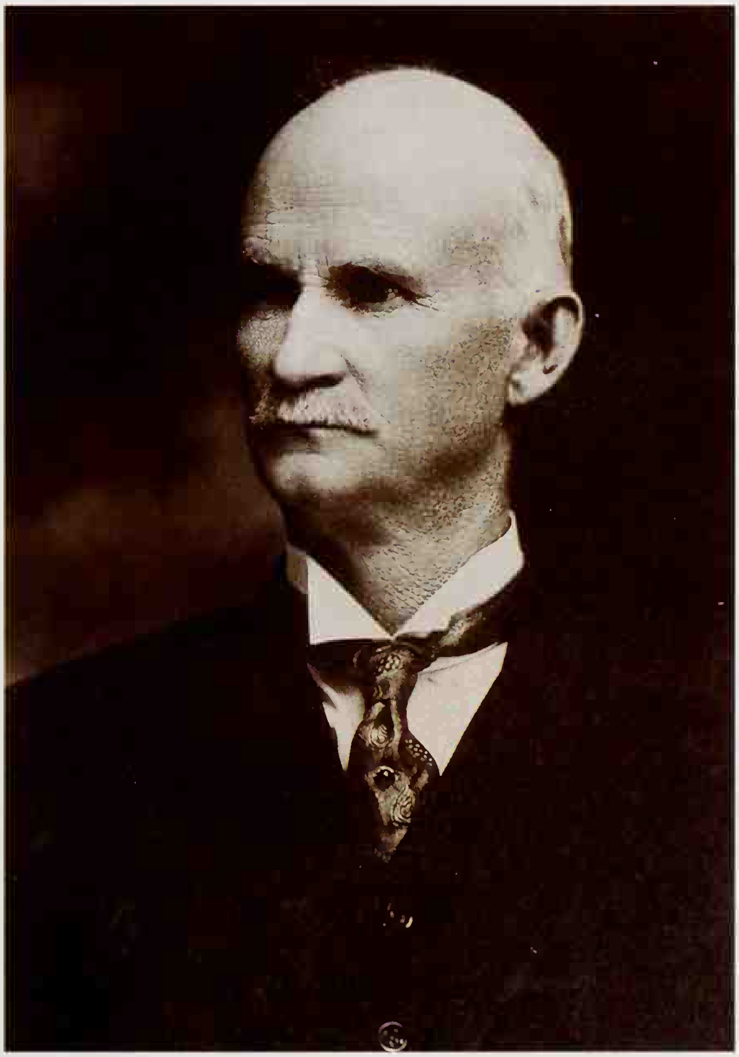
Rifles

Single Shot Rifle. This was John M Browning's first firearm model, invented in 1878 when he was 23 years old. The patent was filed on 12 May 1879, and US Patent Number 220,271 was granted on 7 October 1879. Production by the Browning Brothers in Ogden, Utah Territory, began about 1880 and continued until 1883, with a total of approximately six hundred rifles manufactured. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1883 and the arm appeared in 1885 as the Winchester Single Shot Model 1885.

The Single Shot is a lever action, exposed hammer, fixed barrel single shot rifle. The hammer drops down with the breechblock when the rifle is opened and is cocked by the closing movement. It can also be cocked by hand. The Single Shot has been adapted to over 33 different calibers, more than any other single shot or repeating rifle known. Including both rimfire and center fire types, its loads range from the .22 Short to the .50-90 Sharps. It was the first Winchester rifle capable of handling the most powerful metallic cartridges of the period.

Barrel lengths vary depending on the model, from the light carbine, with a 15-inch barrel, to the 30-inch Schuetzen. Barrel styles are round, octagon, or half octagon. The weight of this arm ranges from 4.5 to 13 pounds, depending on specifications. Model styles include sporting and special sporting rifles, special target rifles, Schuetzen rifle, carbine, musket and shotgun. Stock types are many and various.

Through the years, the Single Shot was produced in a variety of models. The light carbine (called the 'Baby Carbine') appeared in 1898. The takedown model was



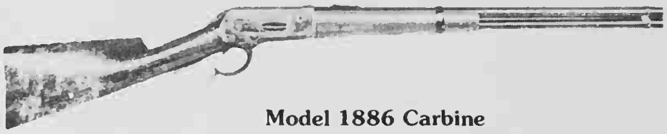
introduced in 1910. A special military target version was introduced in 1905; in 1914 it was revamped as the Winder Musket, named in honor of Colonel CB Winder, and was used for training troops in World War I. In 1914 the Single Shot was also made into a shotgun, chambered for the three inch, 20 gauge shell. The Single Shot was discontinued in all models in 1920. Total production of all models was approximately 140,325, which includes the 600 unit production by the Browning Brothers.

Single Shot Rifle

Winchester Single Shot Rifle

Single Shot Musket

Single Shot, Baby Carbine


Model 1886 Carbine

Model 1886 Lever Action Repeating Rifle. Invented in 1882–83, this was the first Browning-designed repeating rifle to be manufactured. It was also the first repeating rifle to successfully employ sliding vertical locks, which effectively sealed the breech and barrel of the gun; as such it was the forerunner of all later Browning lever action repeating rifles. The patent was filed on 26 May 1884, and the US Patent No 306,577 was granted on 14 October 1884. Purchased by Winchester in October 1884, it appeared in 1886 as Model 1886.

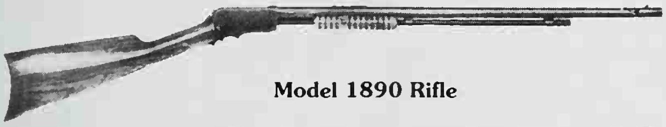
The 1886 Lever Action is a tubular magazine, fixed barrel repeating rifle in a wide variety of calibers, including .45-70 US Government, .40-82 WCF, .45-90 WCF, 40-65 WCF, 38-56 WCF, .50-110, .40-70 WCF, .38-70 WCF, .50-100-450, .33 WCF. Options included a choice of full or half length tubular magazine of varying capacities, depending on the ammunition used.

Safeties on this firearm are manual and mechanical, and barrels include 26-inch round, octagon or half octagon, and 22-inch round. Special barrels and magazines finished to specifications were available until 1908. Stock types range from the sporter with straight or pistol grip, to extra

lightweight, to shotgun, carbine and musket type stocks. The weight varies widely, depending on specifications and caliber.

In 1894, it was converted to a takedown model. In 1936 the Model 1886, slightly modified to handle the .348 Winchester cartridge, became the Model 71. The Model 1886 was discontinued in 1935 with 159,994 produced; the Model 71 was discontinued in 1957 with 43,267 produced—making the total for this gun 203,261 units during a production life of 71 years.

Model 71 Rifle



Model 1890 Rifle

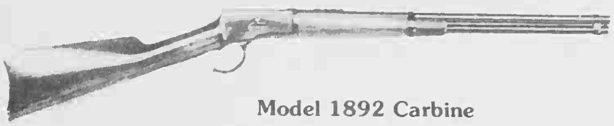
Model 1890 Rifle, Takedown

Model 1890 .22 Caliber Pump Action Repeating Rifle. The patent application for this gun was filed on 13 December 1887, and US Patent Number 385,238 was granted on 26 June 1888. It appeared in 1890 as the Winchester .22 Caliber Repeating Rifle Model 1890, and was the first repeating pump action gun manufactured by Winchester.

The Model 1890 is a tubular magazine repeating rifle of .22 caliber (.22 short, long rifle and WRF; not originally interchangeable) with a tubular magazine of varying capacity (from 15 shorts to 11 long rifles). It has a sliding breechblock, operated by forearm slide, and both manual and mechanical safeties. It has a 24-inch octagon barrel and weighs from 5.75 to six pounds. Available stocks include a standard rifle type, with curved steel butt plate, and straight grip and optional pistol grip stocks.

The Model 1890 has been called 'the most popular .22 caliber pump action rifle ever made.' The radical improvement in this rifle over previous .22 caliber repeaters was the carrier mechanism. Previously no positive method of handling the .22 caliber short cartridges had been developed. Browning suceeded by installing a fingerlike cartridge stop in front of the carrier—this metered one cartridge at a time onto the carrier from the magazine. At the correct instant, when the spent cartridge from the chamber had been ejected, the carrier raised and held the new cartridge in positive alignment with the chamber for loading.

First manufactured with its barrel fixed to the frame, it was converted to takedown in 1893. The Model 06, introduced in 1906, incorporated a modification which enabled one rifle to accept all .22 caliber cartridges, except the .22 WRF. A 20-inch round barrel replaced the 24-inch octagon. In 1932 the Models 90 and 06 were renamed as combined 'Model 62,' with the introduction on both of a barrel with slightly different specifications and new sights. The Models 90 and 06 were discontinued in 1932 with 849,000 and 848,000 produced respectively; the Model 62 was discontinued in 1958 with 409,475 produced—making the total for this gun 2,106,475 units, with a production life of 69 years.



Model 1892 Carbine

Model 1892 Rifle, Takedown

Model 1892 Lever Action Repeating Rifle. This model, first manufactured by Winchester in 1892 and known as the Winchester Model 92, has the same basic design as the Model 1886, and incorporates many of its special features, including the double locking system, covered under US Patent Number 306,577. Two additional patents covered it—Number 465,339, filed on 3 August 1891 and granted on 15 December 1891, and Number 499,005, filed on 19 September 1892 and granted on 6 June 1893.

The Model 1892 is a simplified, lighter version of the Model 86, specifically designed for smaller calibers including .44-40, .38-40, .32-20 and .25-20, with a tubular magazine capacity of from five to 17 rounds. This firearm has both manual and mechanical safeties, and weighs from 5.5 to eight pounds, depending on model and caliber. Barrel lengths and styles include 24-inch round, octagon or half octagon for rifles; 20-inch round for carbines; and 30-inch round for muskets. Shorter barrels from 14 to 20 inches and special lengths up to 36 inches are also available. Stock types include sporting, carbine and musket with straight grips and fancy models with a pistol grip.

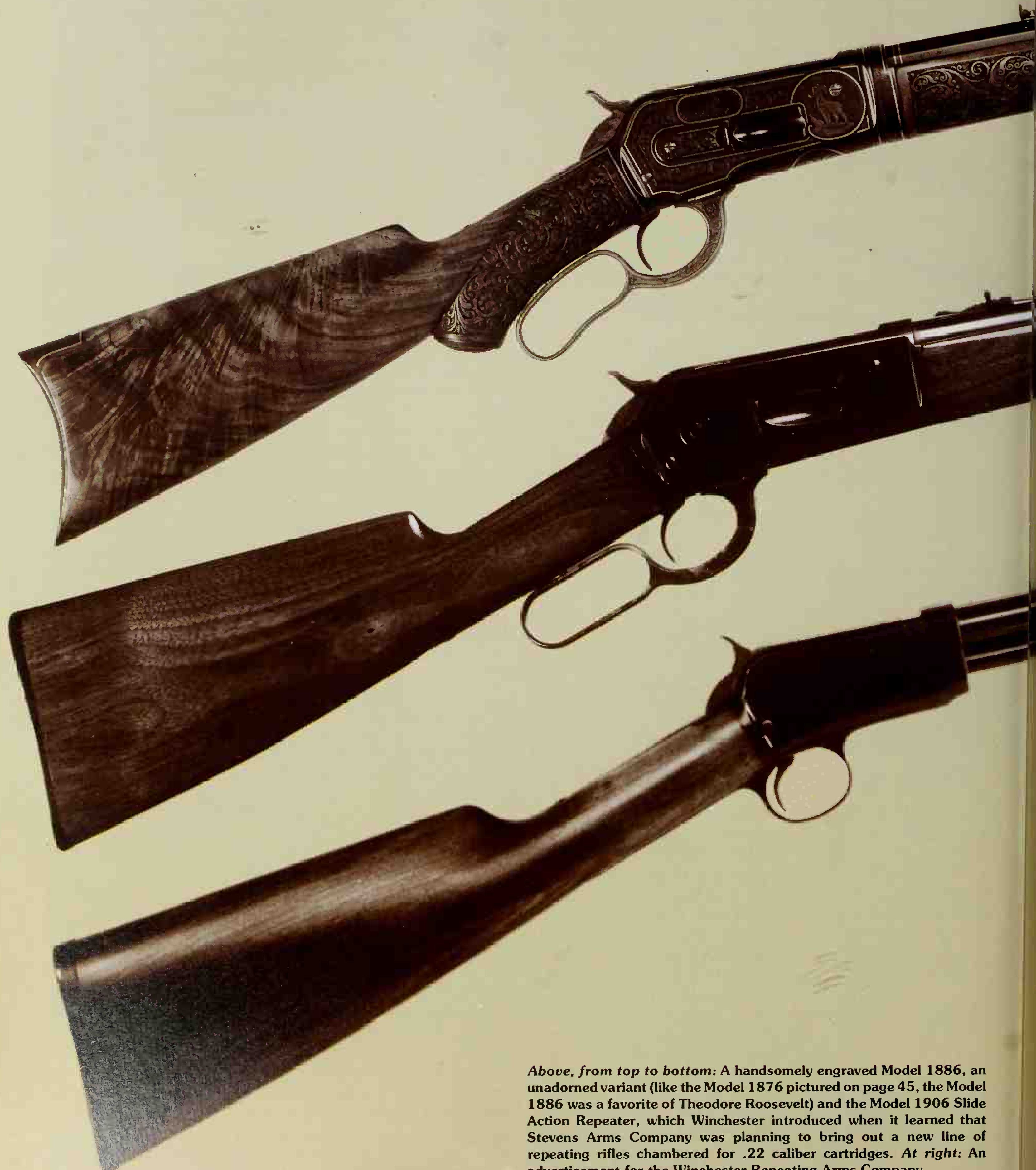
Originally, the 1892 was made with its barrel fixed to its frame, but became available in a takedown model in 1893. A modified version with a decreased magazine capacity was introduced in 1924 as the Model 53. Its successor, the Model 65, was introduced in 1933. The Model 53 was discontinued in 1932 with a total production of 24,916 units; the Model 65 was discontinued in 1947, with a total of 5704 units; the Model 92, though not produced except in the carbine model for several years after the introduction of the Model 53, was not officially discontinued until 1941, at which time 1,004,067 units had been manufactured. The manufacturing total for all variants combined stands at 1,034,687 units.

Model 53 Rifle

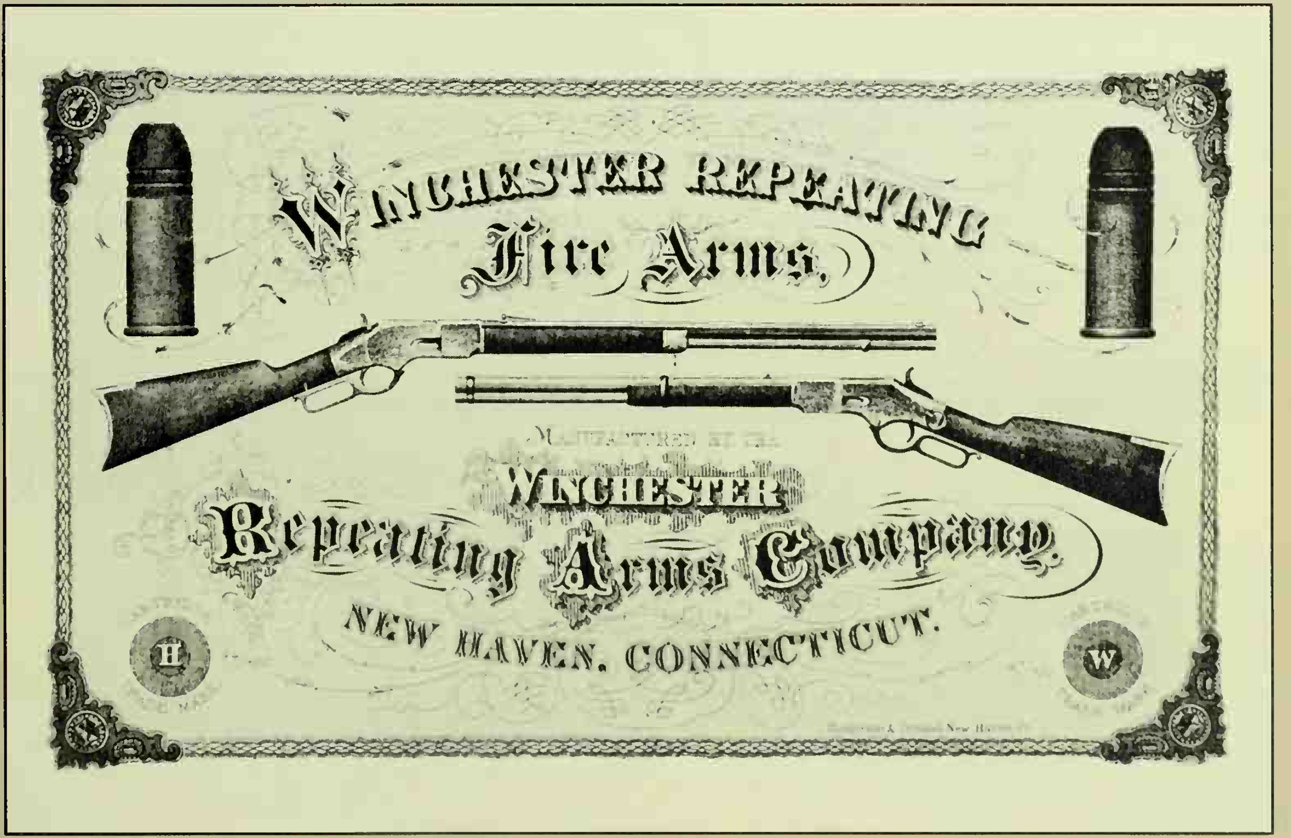
Model 65 Rifle

Model 1894 Lever Action Repeating Rifle. The patent for this gun was filed on 19 January 1894, and US Patent Number 524,702 was granted on 21 August 1894. It was first manufactured by Winchester in 1894 and was known as the Winchester Model 1894. Often called 'the most famous sporting rifle ever produced,' the Model 94 is

Far left: **The Model 1885 Single Shot Schuetzen Rifle. Although repeating rifles were gaining in popularity during the 1880s, such high-quality single shots as this have never lost their loyal following.**



Above, from top to bottom: A handsomely engraved Model 1886, an unadorned variant (like the Model 1876 pictured on page 45, the Model 1886 was a favorite of Theodore Roosevelt) and the Model 1906 Slide Action Repeater, which Winchester introduced when it learned that Stevens Arms Company was planning to bring out a new line of repeating rifles chambered for .22 caliber cartridges. *At right:* An advertisement for the Winchester Repeating Arms Company.



WINCHESTER REPEATING
Fire Arms,

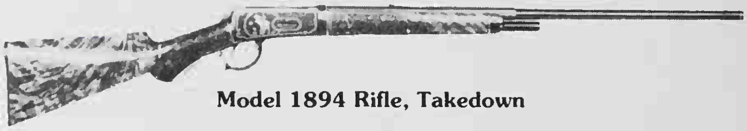
Manufactured by the
WINCHESTER
Repeating Arms Company,
NEW HAVEN, CONNECTICUT.

perhaps best known as the 'Winchester .30-30.' It was revolutionary in that it was the first sporting repeating action rifle to handle smokeless powder cartridges.

It is a lever action, tubular magazine, repeating rifle in .32-40 and .38-55 (both black powder) calibers. In 1895, .25-35 and .30-30 were added, and .32 Special in 1902, all three using smokeless powder. This firearm has a tubular magazine of various capacities, ranging from three to eight cartridges, manual and mechanical safeties, and adjustable sights. Barrel lengths and styles are 20-inch round, 22-inch round, octagonal or half octagonal, and weights range from 5.75 to 6.25 pounds for carbine models, to seven to 7.75 pounds for other variants. Model styles include sporting rifle, fancy sporting rifle, extra lightweight rifle and carbine.

First manufactured as a repeater, the Model 94 became available in a takedown model in 1895. Modified versions include the Model 55, introduced in 1924 (the principal differences being a shorter barrel, a redesigned stock and a

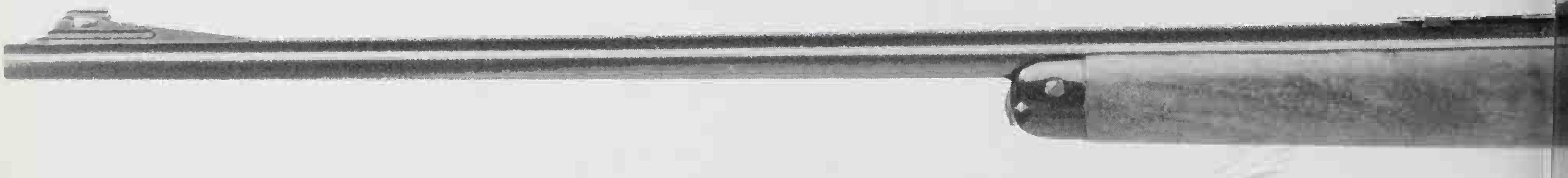
Model 1894 Rifle

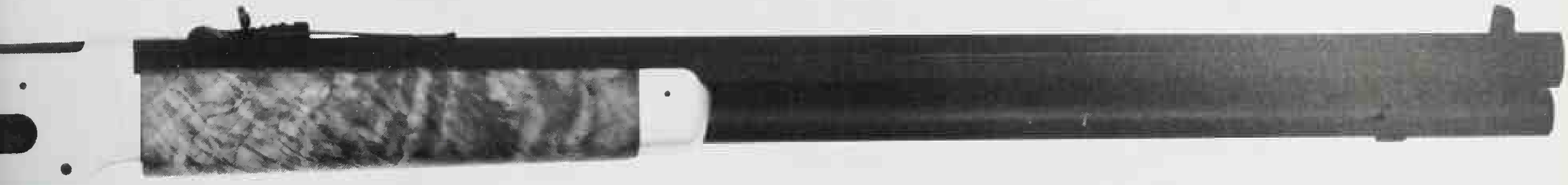


Model 1894 Rifle, Takedown

Model 64 Rifle

***At top, above and below:* The Centennial Model 1894 Rifle and Carbine honoring Oliver F Winchester and Franklin W Olin, respectively, two men who shaped the history of Winchester firearms. *At bottom:* The Model 55.**





switch to half magazine) and the Model 64, introduced in 1933 (the main difference being the steel used). The Model 55 was discontinued in 1932 and the Model 64 in 1957. Still in production as the Model 94 carbine, this rifle has outsold any other manufactured by the Winchester Repeating Arms Company. Over two and a half million had been produced by 1962.

Model 1895 Lever Action Repeating Rifle. The patent application on this gun was filed on 19 November 1894, and US Patent Number 549,345 was granted on 5 November 1895. It was first manufactured by Winchester in 1896 and was known as the Winchester Model 95. This was the first nondetachable box type magazine rifle designed to handle the jacketed sharp nosed bullets.

It is a lever action rifle, with a wide range of calibers—.30 US Army (Krag), .38-72, .40-72 Winchester, .303 British, .35 Winchester, .405 Winchester, .30 Government 1903, .30 Government 1906, 7.62mm Russian. This firearm has a box magazine of from four to six rounds capacity, and manual and mechanical safeties. Barrel lengths are varied, from 22 to 36 inches in round, octagon or half octagon styles. Weight also varies, depending on barrel and caliber. Available stock types include sporting and fancy sporting, carbine and musket.

Four slightly differing versions of the musket appeared between 1895 and 1908. One, the Musket .30 Army Model 1895 US Army Pattern, was adopted by the US Army in 1895. The same year some 10,000 muskets chambered for the .30-40 Krag cartridge were purchased by the US Army for use in the Spanish-American War. Prior to America's entry into World War I, 293,816 of these guns, chambered for the 7.62mm Russian cartridge, were sold to Russia. A takedown version of the rifle appeared in 1910. Model 95 was discontinued in all models in 1931 with a total production of 425,881 units.

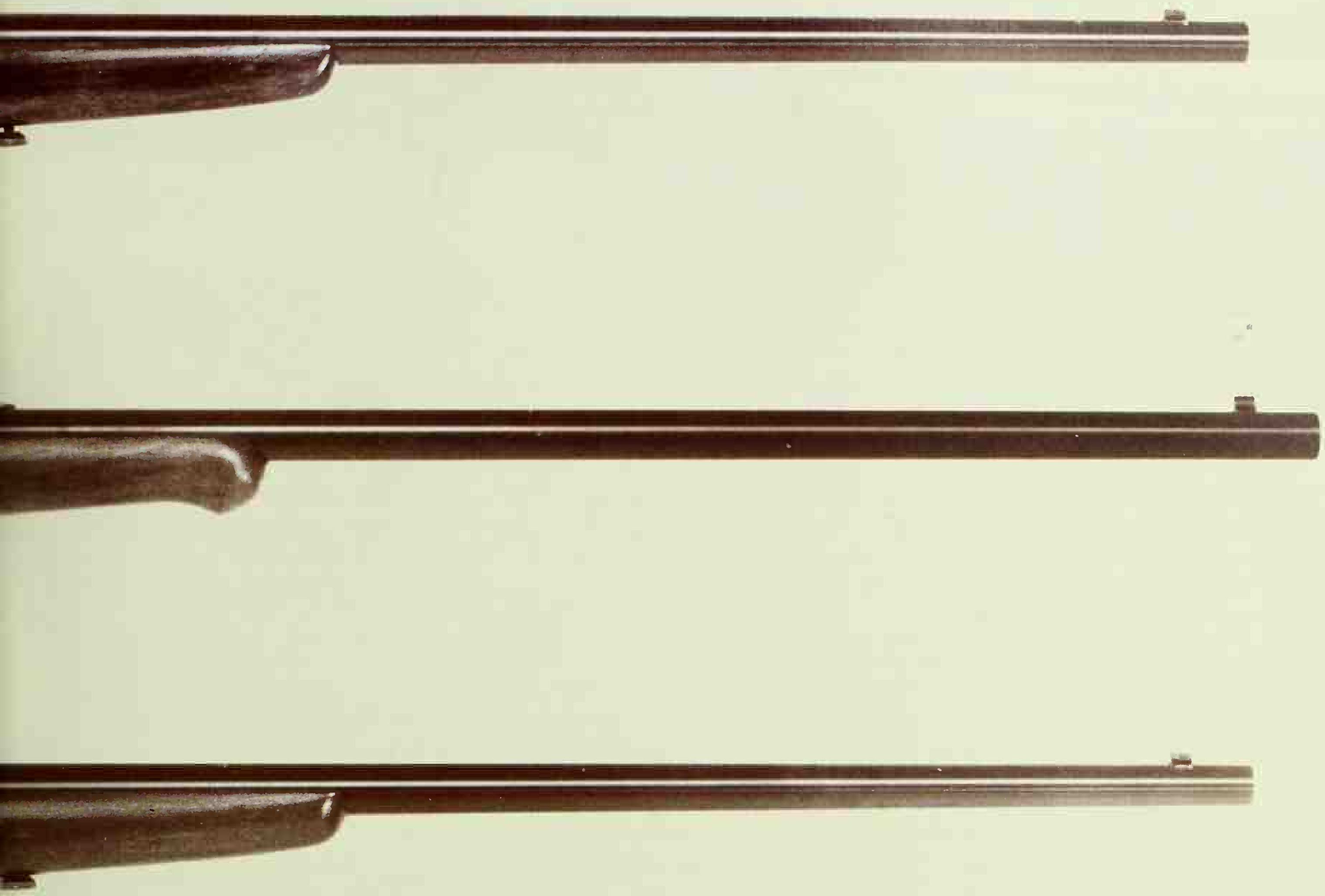
Model 1900 Bolt Action Single Shot .22 Caliber Rifle. The patent application on this gun was filed 17 February 1899, and US Patent Number 632,094 was granted 29 August 1899. It was first listed in the Winchester 1899 catalogue as the Winchester Model 1900 Single Shot Rifle. Designed as a low priced, single shot 'plinking' rifle, it has an especially simple construction and has been widely copied.

It is a bolt action, single shot, takedown rifle of .22 caliber (short and long, interchangeable), with a manual safety. This Single Shot Rifle weighs 2.75 pounds, has an 18-inch round barrel, and is available with a straight grip.

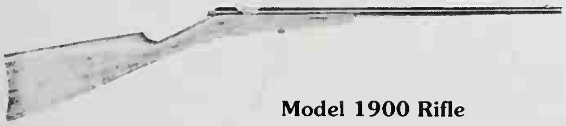
The Model 1900 was discontinued in 1902; the Model 1902, announced the same year, has a modified trigger guard shape, a short trigger pull, a steel butt plate, a rear peep sight and a slightly heavier barrel. In July of 1904, another slightly modified version appeared, the Model 1904, which has a longer, heavier barrel and a differently shaped stock.

An interesting modification is the Model 99 Thumb Trigger Rifle, which also appeared in 1904. This rifle is void either of trigger or trigger guard. Just behind the cocking piece on the bolt is a button called the thumb trigger. When in shooting position, the shooter merely presses downward on this button with the thumb to release the firing pin.

In 1928 and the years following, Winchester brought out other variations, the Models 58, 59, 60 and 68. In 1920, a shotgun version similar to the Model 1902 was announced;

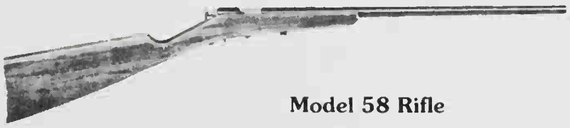


Modifications of the Model 1900 Single Shot Rifle. *Above, from top to bottom:* The Model 99 Thumb Trigger Rifle, which had a button, not a standard trigger, to release the firing pin; the Model 1904 Rifle with a heavy target barrel; and the Model 1902 Rifle, with improved trigger guard and improved trigger pull.



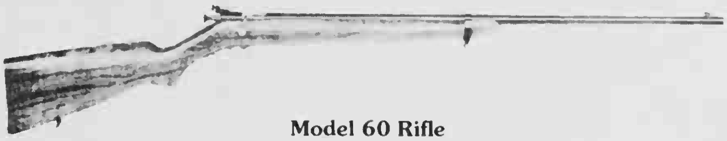
Model 1900 Rifle

this was the Winchester Model 36 Single Shot Shotgun. This is the only American made shotgun chambered for 9mm paper shells; it was discontinued in 1927. The last model, the 68 (introduced in 1934) was discontinued in 1946. Production totals are as follows: Model 1900, 105,000; Model 02, 640,299; Model 04, 302,859; Model 99 Thumb Trigger, 75,433; Model 36 Shotgun, 20,306; Model 58, 38,992; Model 59, 9293; Model 60, 165,754; and Model 68, 100,730 for a total of 1,458,666 units.

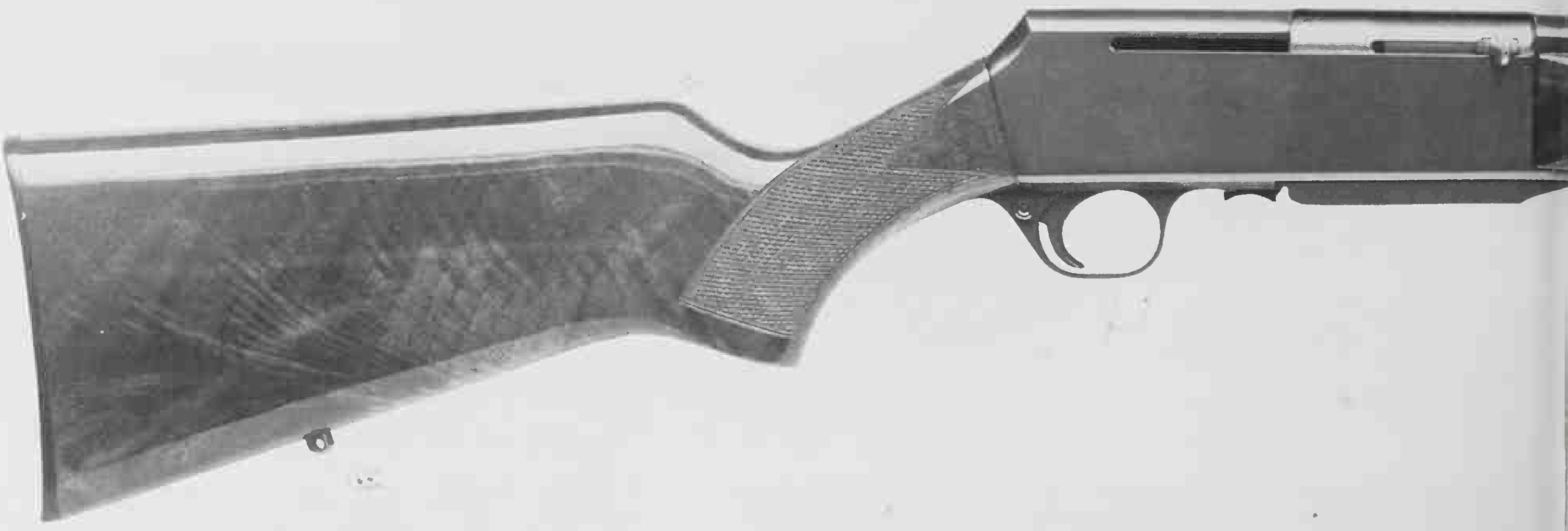


Model 58 Rifle

Model 59 Rifle



Model 60 Rifle



The Browning Automatic Rifle. The Browning Automatic Rifle was invented prior to 1917. The patent application on this gun was filed on 1 August 1917, and US Patent Number 1,293,022 was granted on 4 February 1919. Best known as the BAR, it is also known as the Browning Light Machine Rifle Model 1917, the Light Browning, the Colt Automatic Machine Rifle, and the Fusil Mitrailleur Browning. The BAR was officially adopted by the United States government in 1917 and first saw combat use in July of 1918.

The specifications that follow refer to the Colt Model 1917. It is an air cooled, gas actuated, automatic machine rifle. The BAR has a caliber of .30-06, with a detachable box magazine of either 20 or 40 rounds, staggered arrangement. The safety is a fire control change lever. When the change lever is in its forward position, marked with the letter 'F,' the rifle will shoot one shot with each pull of the trigger. In vertical position, marked with the letter 'A,' the rifle will fire full automatic. In the rearward position, marked by the letter 'S,' the rifle is safe. On some models, the 'F' position, when the lever is all the way forward, merely reduces the rate of fire in such a way that single shots may be fired by quickly pulling and releasing the trigger. It weighs 17.37 pounds with full magazine, and has a 24-inch round barrel. Stock type is standard rifle only, with pistol grip. A takedown, its 70 pieces can be completely disassembled and reassembled in 55 seconds.

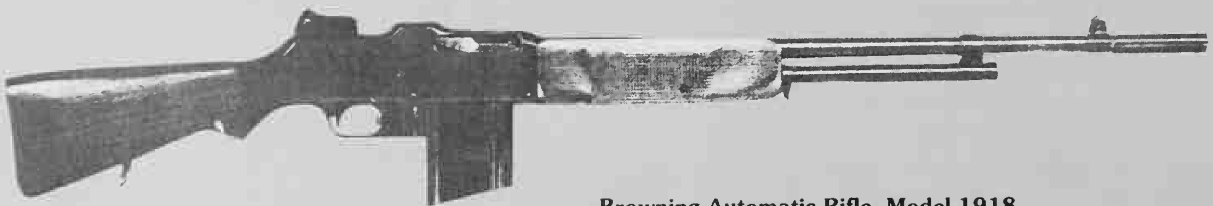
A lever on the receiver permits fully automatic or semiautomatic firing. At full automatic, it can be fired at a maximum rate of 480 rounds per minute, emptying a 20 round magazine in two and one-half seconds. This rifle has a bolt lock which pivots to the rear of the bolt, and rises in and out of locking engagement with a shoulder on the receiver. The rear of the bolt lock is attached to the slide by a link, which is free to reciprocate backward and forward. Attached to the forward part of the barrel is a gas piston which derives its energy from a gas port drilled through the barrel wall. In operation, the piston sends a slide to the rear, and, in turn, the slide, through its link connection with the bolt lock, pivots the bolt lock downward out of locking contact with the receiver.

During World War I approximately 52,000 were manufactured by Colt, Winchester, and Marlin-Rockwell. After World War I, production rights reverted to Colt and, by arrangement with John M Browning, Fabrique Nationale began European production in 1920, calling their model the Fusil Mitrailleur Leger. Large quantities of the rifle have since been manufactured for various European countries. It was made in 6.5mm, 7mm, 7.62mm, 7.9mm and .30-06 caliber. It has been widely copied; many nations historically have had the BAR or a similar gun in reserve.

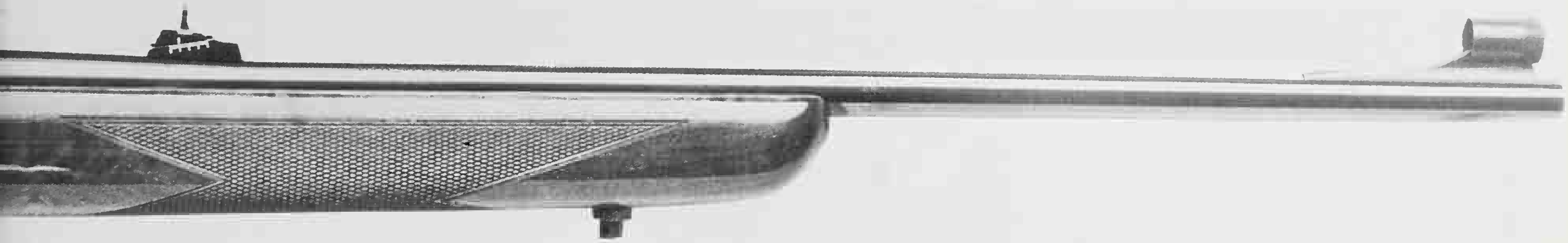
In 1922 the US Army brought out its Cavalry Model. In 1933, Colt produced the 'Colt Monitor' for police and bank guard use. In November 1939, there were approximately 87,000 in our war reserve. Approximately 177,000 were produced in this country during World War II. In comparison with earlier models, the World War II BAR, the M1918-A2, is slightly heavier and equipped with flash hider and bipod. It carries the conventional stock without pistol grip. A decelerating device permits a cyclic rate of fire of 350 to 550 rounds per minute. No mechanical provision is made for semiautomatic fire, but, at a low rate of fire, single shots can be discharged by pulling and quickly releasing the trigger.

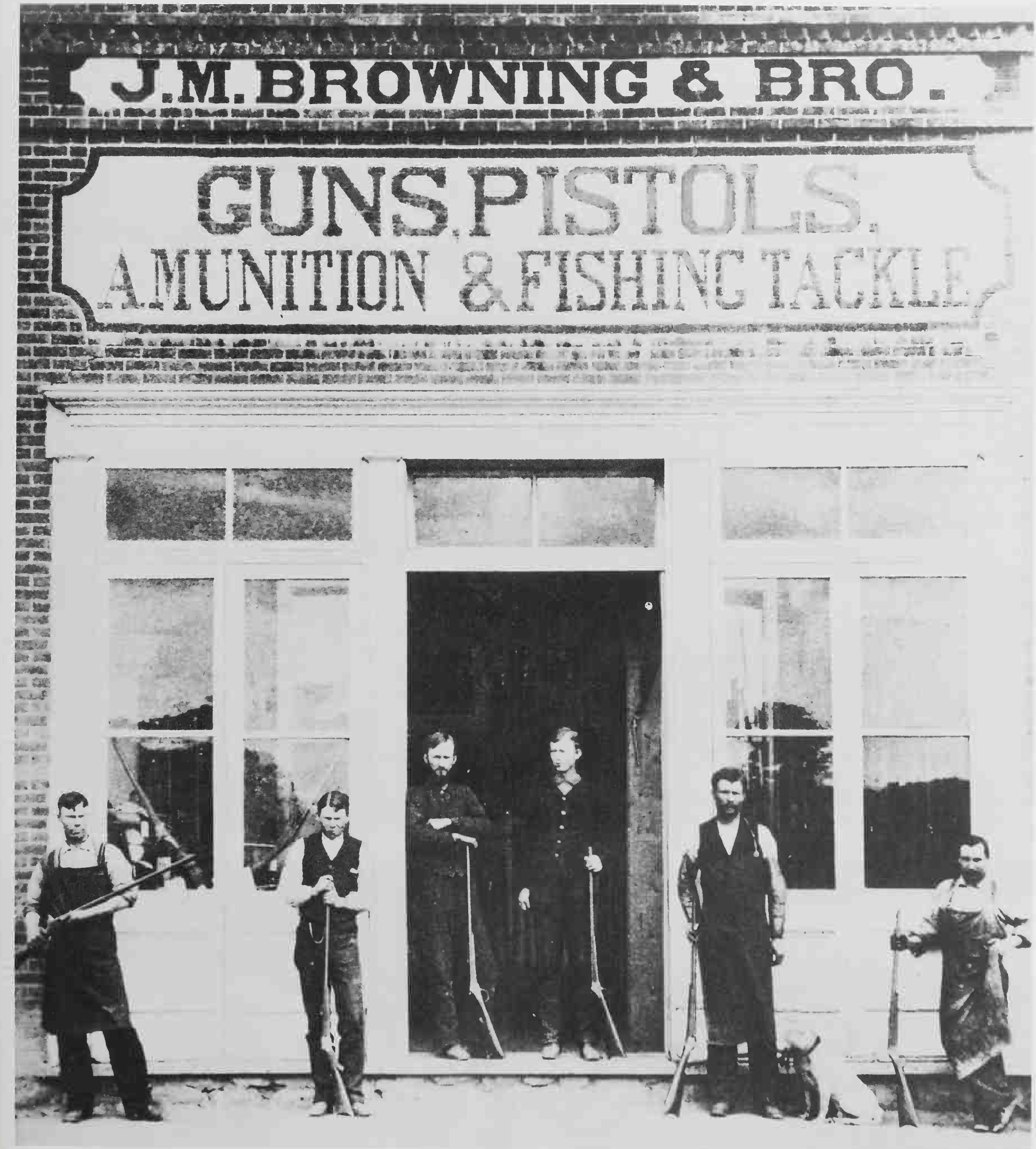
The Fabrique Nationale version differed from the Colt model chiefly in having a quicker takedown mechanism which allowed the barrel to be removed easily for replacement. Total production by FN to the end of 1961 was 67,310 units.

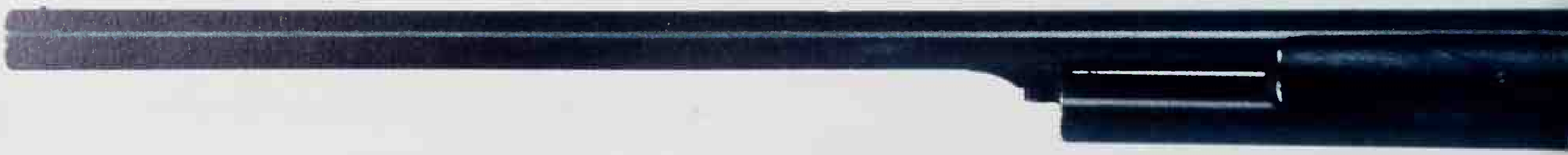
***At top:* The Browning Automatic Rifle—aka BAR. *At right:* The original Browning Brothers Store in Ogden, Utah, circa 1882—and the staff of 'The Largest Arms Factory Between Omaha and the Pacific.'**



Browning Automatic Rifle, Model 1918




J.M. BROWNING & BRO.
GUNS, PISTOLS,
AMUNITION & FISHING TACKLE



Shotguns

Model 1887 Lever Action Repeating Shotgun. This was the first lever action repeating shotgun made in the United States and has been called 'the first really successful repeating shotgun.' The patent application on this gun was filed on 15 June 1885 and US Patent Number 336,287 was granted on 16 February 1886. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1886, and it appeared in June 1887 as the Winchester Model 1887 Shotgun.

It is a lever action repeating shotgun in 10 and 12 gauge, with a tubular magazine that holds four shells in the magazine and one in the chamber. In 1898, 10 and 12 gauge riot guns were added. Barrel lengths are 30 and 32 inches for both the 10 and 12 gauge, with full chokes and 20 inches for the 10 and 12 gauge riot gun, with cylinder bore. The 10 gauge weighs about nine pounds; the 12 gauge, about eight pounds. The standard stock is plain with a pistol grip and a hard rubber butt plate.

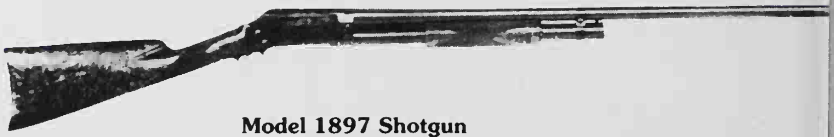
The model 1887 was discontinued in 1899. Redesigned to handle the smokeless powder loads, it reappeared in 1901, in 10 gauge only, as the Model 1901. This model was discontinued in 1920. 64,855 of the Model 1887 were produced and 13,500 of the Model 1901—for a total of 78,355.

Model 1893 Shotgun

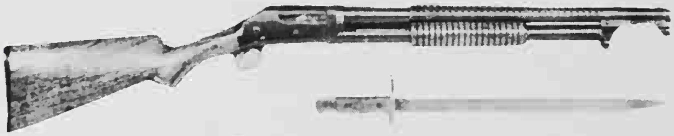
Model 1893 Pump Action Repeating Shotgun. The patent application on this gun was filed on 30 June 1890, and US Patent Number 441,390 was granted on 25 November 1890. Manufacturing and sales rights were sold to the Winchester Repeating Arms Company in 1890; the gun was announced in April 1894 as the Winchester Model 1893. This was the first shotgun with a sliding forearm of pump action manufactured by Winchester.

It is a pump action repeating shotgun in 12 gauge with a five shot, tubular magazine. Barrel lengths are 30 and 32 inches with a full choke—modified choke or cylinder bore specials being available. The Model 1893 weighs about 7.75 pounds and is available in plain stocks with pistol grip and a hard rubber butt plate.

The Model 1893 was discontinued in 1897 when the Model 1897, a modified takedown version of the Model 1893, was introduced. Total production was 34,050 units.



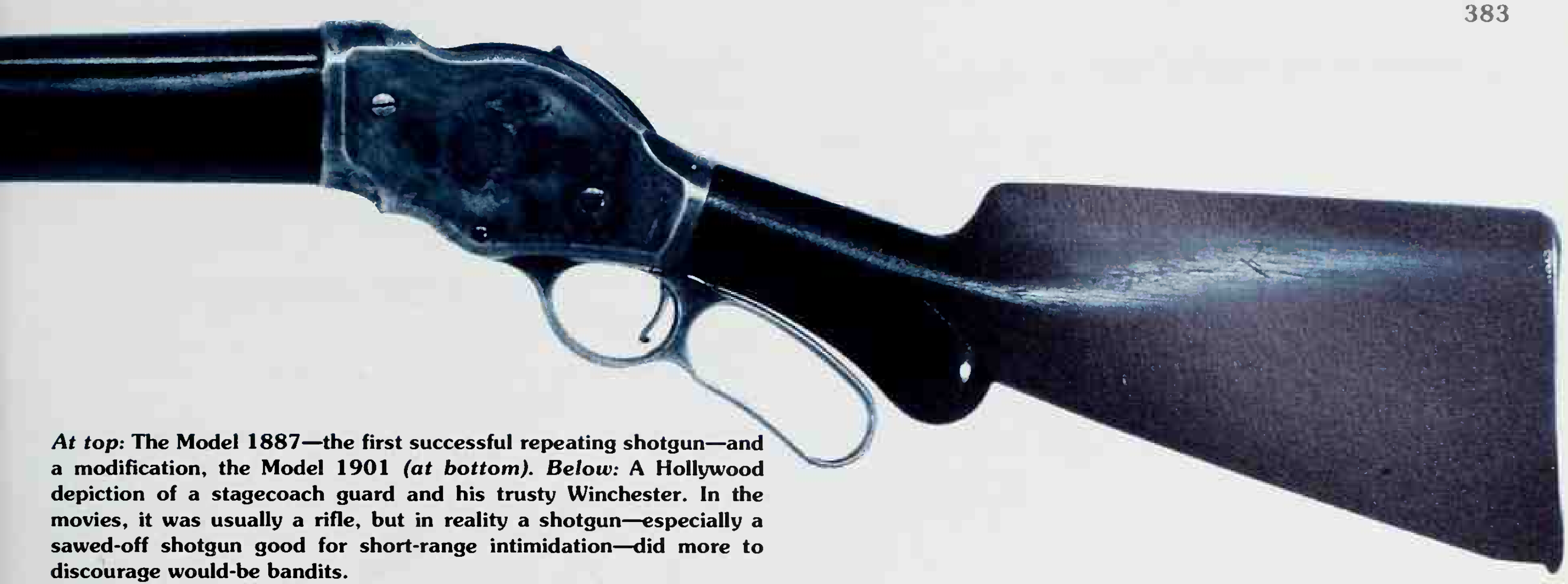
Model 1897 Shotgun



Model 1987 Trench Gun

Model 1897 Pump Action Repeating Shotgun. The Model 1897 is a modified takedown version of the Model 1893, with a stronger frame and side ejection. Introduced in November of 1897, it soon became one of the most popular shotguns in America. It is a pump action repeating shotgun in 12 and 16 gauge (takedown exclusive on the 16, and optional on the 12) with a five shot, tubular magazine. Variant examples have barrel lengths of 20, 22, 26, 28, 30 and 32 inches, with cylinder bore, modified, intermediate, full or Winchester skeet chokes. The weights of the various examples of the Model 1897 are from 7.1 to 7.9 pounds, and standard stocks are plain, with pistol grip and hard rubber butt plate, plus optional checkering and other specialties having been available.

In addition to its great popularity as a sporting arm, the 97 saw other uses. A short barrel version was widely used as a riot gun by law enforcement agencies; also for a time the American Express Company armed its messengers with this



At top: **The Model 1887—the first successful repeating shotgun—and a modification, the Model 1901** ***(at bottom). Below:*** **A Hollywood depiction of a stagecoach guard and his trusty Winchester. In the movies, it was usually a rifle, but in reality a shotgun—especially a sawed-off shotgun good for short-range intimidation—did more to discourage would-be bandits.**

BUTTERFIELD STAGE

firearm. During World War I the 97 was used by American troops as a trench gun, with considerable success.

The standard, trap, pigeon and brush guns were introduced in 1897, followed by the riot gun, in 1898; the tournament, in 1910, and the trench gun, in 1920, (but previously manufactured for the US Army use in World War I). The trap gun was discontinued in 1931 and was succeeded by the special trap gun, which was discontinued in 1939. Other models were discontinued as follows—the pigeon gun was discontinued in 1939, the brush gun in 1931, the riot gun in 1935 and the trench gun in 1935.

The tournament gun was discontinued in 1931 and was succeeded by the standard trap, which was discontinued in 1939. The standard Model 1897 was discontinued in 1957. Total production for all models stands at 1,240,700.

Winchester's Rare Brownings

John M Browning sold Winchester a total of 44 firearms—31 rifles and 13 shotguns. Of this number, only seven rifles and three shotguns were actually manufactured. Most of the remaining 34 arms, comprising 24 rifles and 10 shotguns, exist only as one-of-a-kind prototype specimens in either the Winchester or Browning Museums.

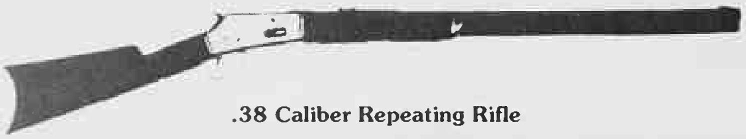
Among the rarest guns in the world, they are unique in design, functionality and construction. The Winchester Museum also contains three other Browning rifles and one other shotgun that were neither bought by Winchester nor patented for manufacture principally because they infringed previously existing patents.

The following is a listing of these rarest-of-the-rare American firearms.

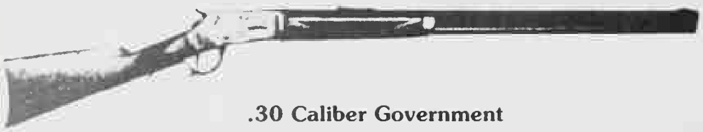
Rifles

Repeating Rifle in .38 Caliber. The patent application on this gun was filed on 6 March 1884, and US Patent number 312,183 was granted on 10 February 1885. This .38 caliber rifle has a 28-inch octagon barrel and weighs 9.25 pounds. In this lever action, tubular magazine rifle, the locking arrangement of the breechblock is greatly simplified, inasmuch as the lever itself, having a seat in the receiver, acts as the locking lug.

The lever is spring loaded in such a way as to allow the lever to snap in and out of engagement with its socket, or locking shoulder, in the receiver.



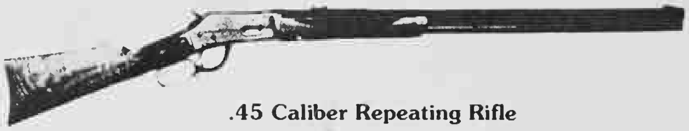
.38 Caliber Repeating Rifle



.30 Caliber Government Repeating Rifle

Lever Action .30 Government Caliber Repeating Rifle. The patent application for this gun was filed on 5 March 1885, and US Patent number 324,296 was granted on 11 August 1885. This lever action, .30 Government caliber, tubular magazine rifle has a 28-inch octagon barrel and weighs 9.25 pounds.

The main novelty of this gun is its locking lug, which is pivoted on the rear of the sliding breechblock in such a manner that the front end rises in and out of locking engagement with the receiver and breechblock. The locking lug also serves as the link between the rotary motion of the lever, and the longitudinal motion of the breechblock.

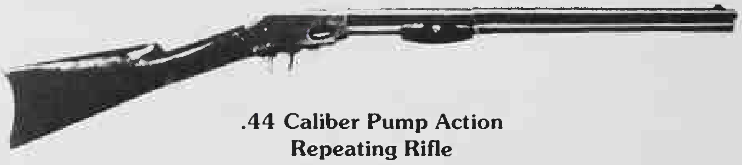


.45 Caliber Repeating Rifle

Lever Action Repeating Rifle in .45 Caliber. The patent application for this gun was filed on 26 May 1885, and US Patent number 324,297 was granted on 11 August 1885. It has a 28-inch octagon barrel and weighs 9.25 pounds. This .45 caliber, lever action, tubular magazine rifle features a toggle locking system, wherein the lever is the front part of the toggle, which 'bears' in a socket in the breechblock.

The rear half of the toggle pivots at the rear, against the receiver, and houses the trigger. Opening the lever flexes the toggle joint and allows the bolt to slide to the rear.

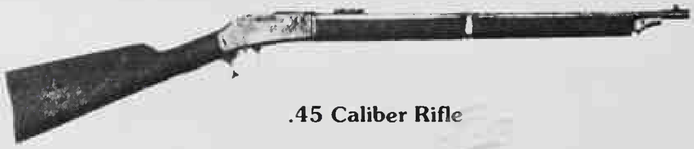
As in many of John M Browning's designs, one part has several functions: the links of the toggle joint serve to form a stout breech locking system, and act as the linkage necessary to reciprocate the breechblock. The action also features a firing pin block which renders the gun safe until the lever piece is fully closed.



.44 Caliber Pump Action Repeating Rifle

Pump Action Repeating Rifle in .44 Caliber. The patent application on this gun was filed 12 July 1886, and US Patent number 367,336 was granted 26 July 1887. This .44 caliber firearm has a 20-inch round barrel and weighs close to six pounds. It is a pump action rifle having a tubular magazine and a pivoting breechblock, the rear end of which rises into locking engagement with the receiver.

Instead of being placed to the rear of the breechblock, as is most common, the hammer works through a recess nearly in the middle of the breechblock, allowing for a very short receiver. The tail end of the hammer projects into the trigger guard forward of the trigger, allowing the hammer to be cocked or uncocked manually.



.45 Caliber Rifle

Lever Action Repeating Rifle in .45 Caliber. The patent application on this gun was filed 21 November 1887, and US Patent number 376,576 was granted 17 January 1888. This lever action, tubular magazine .45 caliber rifle has a 22-inch round barrel and weighs 7.2 pounds. It loads through the bottom and ejects from the top of the receiver.

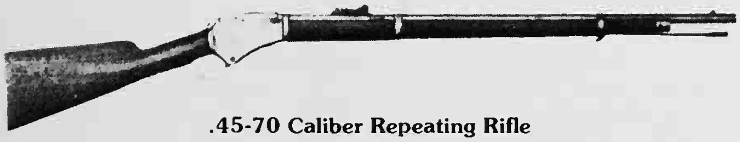
The forward end of the operating lever contains the lock mechanism. The operating lever is hung to the receiver by a link, which extends to the rear. The forward end of the lever is guided by channel cuts in the receiver. The sliding firing pin acts as a hammer and is cocked by the closing movement of the lever.

Lever Action Repeating Rifle in .45-70 Caliber. The patent application on this gun was filed on 18 November 1889, and US Patent number 428,887 was granted on 27 May 1890. This .45-70 caliber, box magazine rifle has a 28-inch round barrel and weighs 8.1 pounds.

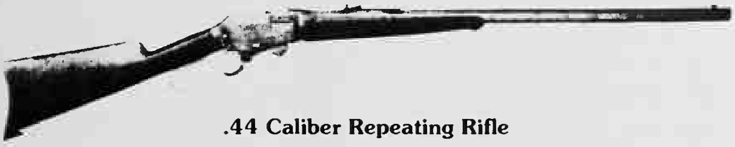
In this unique firearm the breechblock, magazine and lever are one unit. With the lever closed the assembly is in locking engagement with the receiver and comprises an effective breech closure. The cartridges ride in the magazine recess in a 'bullet end down position,' with magazine spring pressure urging them forward. Opening the lever turns this whole assembly and brings the cartridges in line with the bore. This rifle can be operated either as a repeater or as a single shot firearm.

A selector lever on the side of the magazine portion urges the top cartridges out of the magazine into loading position. Closing the lever completes the loading cycle. Extraction is to the side and is effected by a combination extractor and pivot slide attached to the breech assembly.

Another interesting feature of this rifle is the firing pin, which acts as its own pivot sear. The front of the firing pin is latched in cocked position by a hardened screw in the receiver. A lever attached to the trigger pushes the rear of the firing pin upward, pivoting the striker out of engagement with the hardened screw.



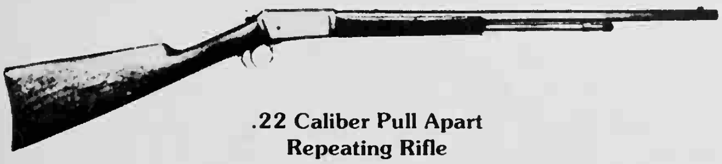
.45-70 Caliber Repeating Rifle



.44 Caliber Repeating Rifle

Lever Action Repeating Rifle in .44 Caliber. This is a lever action, integral revolving magazine rifle, and is very similar to the .45-70 Caliber Lever Action Repeating Rifle. The lever, magazine and breechblock are essentially one piece; the cartridges ride 'bullet down' in the magazine; the magazine is loaded from the bottom and the cartridges are inserted upward, rim first.

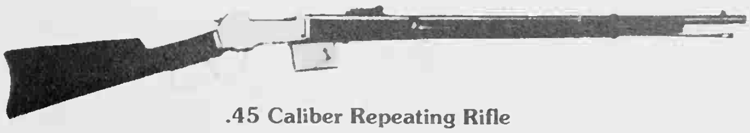
The unique feature of this rifle is the arrangement of the firing pin and the method for inserting the cartridges.



.22 Caliber Pull Apart
Repeating Rifle

Pull Apart Repeating Rifle in .22 Caliber. This firearm is of the pull apart variety. Operation of the action is effected by literally pulling it open to its full extension of seven-eighths of an inch, just far enough for its .22 caliber cartridges, which are fed by a carrier from a tubular magazine.

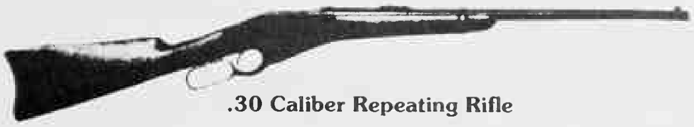
Ignition is by a striker, the rear end of which projects from the rear of the receiver. The two main parts are unlocked from each other by pulling the trigger.



.45 Caliber Repeating Rifle

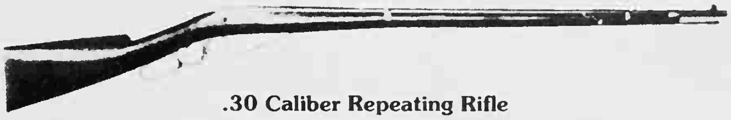
Lever Action Repeating Rifle in .45 Caliber. This military type rifle, with detachable box magazine, features a locking system with vertically rising locking lugs that are similar to the Winchester 86 and 94 models, but utilizes a striker rather than a hammer.

The novelty in this firearm is the magazine, which is positioned for the most part under the barrel forward of the breech face. The cartridges are pulled rearward out of the magazine onto a carrier by the breech bolt during its rearward movement. The carrier then lifts the cartridges into position for loading by the breech bolt during its forward movement.



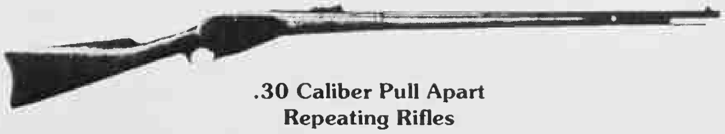
.30 Caliber Repeating Rifle

Lever Action Repeating Rifle in .30 Caliber (Number One). In this lever action box magazine rifle, the locking block is pivoted to the receiver immediately to the rear of the hammer, and encloses the hammer on both sides. Initial motion of the lever pivots the locking block downward, allowing the breechblock to slide to the rear. Ejection and loading of the magazine are through the top.



.30 Caliber Repeating Rifle

Lever Action Repeating Rifle in .30 Caliber (Number Two). This military type, box magazine lever action rifle features a novel hammer arrangement. The hammer does not pivot, as is usual in lever action rifles; it is essentially a striker which works in a recess in the upper tang of the receiver, and has an exposed ear for manual cocking. As is the case in most of Browning's lever actions, cocking is automatic with the operation of the lever. Loading is from the top by means of a cartridge clip.



.30 Caliber Pull Apart
Repeating Rifles

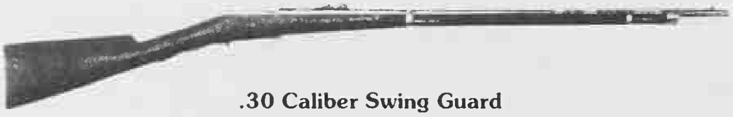
Pull Apart Repeating Rifle in .30 Caliber. This pull apart musket type rifle, with box magazine, operates in the manner common to pull-apart designs. The receiver and barrel assembly, and the breechblock, trigger guard and stock assembly, separate at a predetermined distance, allowing the end of the breechblock to pick up rounds from the magazine.

Connecting the two main components is a tube, inside of which the hammer works like a piston. The small finger piece at the front of the trigger guard is a sear block safety. The breechblock locks at the rear on a shoulder in the receiver.

A second variant of this design was also sold to Winchester. This model has a safety which locks the sear with the hammer cocked, and also locks the gun against accidental operation.

.44 Caliber Repeating Rifle

Lever Action Repeating Rifle in .44 Caliber (Number Three). This lever action, tubular magazine repeating rifle has the same action as the Winchester Model 92. It is identical in principle and differs only in minor detail.



.30 Caliber Swing Guard
Repeating Rifle

Swing Guard Repeating Rifle in .30 Caliber. This novel firearm works like a lever action with the lever mounted backward. The trigger is pivoted to the frame at its rear. The front of the guard is latched to the rear of the box magazine by a spring latch.

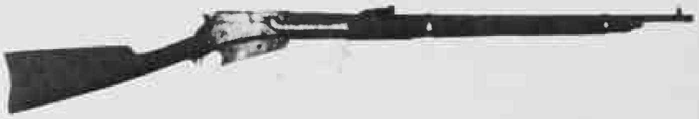
.22 Caliber Rimfire
Single Shot Rifles

Rimfire Single Shot Rifle in .22 Caliber. This rifle, like the three models which follow, is of extremely simple design. The breechblock, hammer and trigger are one piece, and operate up and down at about 20 degrees from the vertical. In loading, the breech bolt is pushed down until the tail of the breechblock extends into the trigger guard, and is latched there against the force of the mainspring, which forces the breechblock upward into a locked position with the barrel.

The firing pin is a hardened pin installed rigidly on the face of the breechblock. A thumbpiece projects from the rear of the breechblock for the purpose of pushing it downward into locked position. The tail of the breechblock acts as a trigger. The gun is ready to fire the moment a fresh cartridge is placed in the chamber.

Pulling the trigger allows the breechblock assembly to spring forcibly upward into locked position. The built in firing pin ignites the cartridge simultaneously. Extraction is manual with two clearance cuts on the rear of the barrel to allow the fingers to pick out the cartridge.

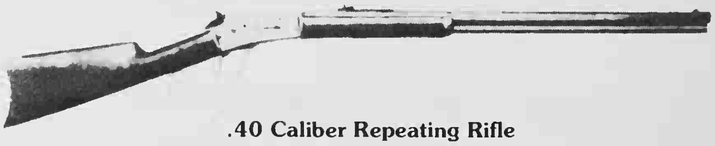
A second version of this design differs in the use of a simple pushrod type extractor and a different spring arrangement on the breechblock. The third variant uses a different type of mainspring, and incorporates various minor detail changes. The fourth, and final, variant is unique only in that its replaceable firing pin is screwed into the back of the breechblock.



.30 Caliber Pump Action
Repeating Rifle

Pump Action Repeating Rifle in .30 Caliber. This rifle has a box magazine which loads from the bottom. The breechblock is locked into a recess in the left side of the receiver, and is positively held in locking engagement with the receiver by a locking cam on the slide.

The breechblock, instead of rising into a vertical position, moves laterally into a locking position with the receiver. This gun cannot be fired until it is completely locked. The action is very smooth and is suitable for relatively low pressure cartridges.



.40 Caliber Repeating Rifle

Lever Action Repeating Rifle in .40 Caliber. This tubular magazine rifle features a one piece locking block, which lifts vertically as it closes the lever into a recess at the rear of the bolt. The locking block is raised in and out of locking position by a link which also serves as a trigger housing. This arrangement disconnects the trigger from the sear until the action is fully closed.

.236 Caliber Repeating Rifle

Lever Action Repeating Rifle in .236 Caliber. This rifle has a box magazine, and loads and ejects obliquely out the top of the receiver. Its tilting breechblock is guided at the front only, with the rear being left free to follow the lever through its downward arc.

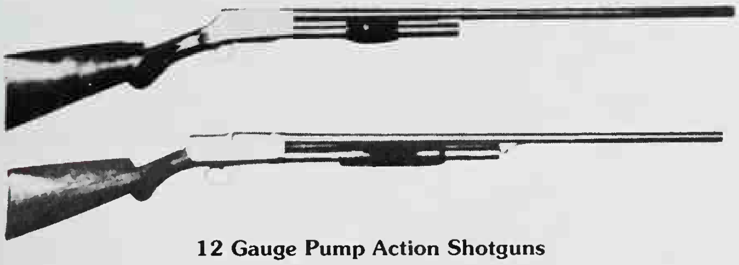
This downward motion of the lever allows for a short receiver. The actuating lever carries the trigger and hammer as a unit. The hammer is cocked by closing the lever. A projection on the rear of the mainspring guide latches the lever in closed position.

.30 Caliber Repeating Rifle

Bolt-sear Lever Action Repeating Rifle in .30 Caliber. In this lever action rifle, the sear is part of the bolt assembly, and acts on a striker, which allows the trigger to pivot as a unit with the lever. The box magazine is attached with a screw and is not freely detachable. The receiver is cut away to conform to a one piece stock. The safety on this is on the top tang to the rear of the receiver.

A second variant of this design has a two piece stock and the magazine is inside the receiver. Its magazine loading arrangement features staggered double rows of cartridges.

Shotguns



12 Gauge Pump Action Shotguns

Pump Action Shotgun in 12 Gauge. This 12 gauge, pump action shotgun is locked by a turning breechblock which is actuated by a cam slot in the slide. The slot in the receiver to the rear of the ejection opening is the passage or clearance for the large locking lug on the bolt.

The long, rail type locking lug acts as a guide for the cylindrical breechblock as it reciprocates. A standard type carrier elevates the cartridges from the tubular magazine into loading position. On the front of the carrier, however, is a simple dog which serves as a cartridge stop. A second, similar design was also sold to, but not manufactured by, Winchester. A third variant has a pivoting breechblock which locks at the rear of the side of the receiver. The slide which manipulates the breechblock is mounted on the opposite side of the receiver in such a way as to completely close the ejection opening when the gun is closed. The rear end of the magazine can pivot downward free from the receiver, allowing the tube and handle to be used as a wrench for unscrewing the barrel from the receiver.

A fourth variant has a locking system that is unusual but exceptionally strong. Instead of rotating, or pivoting, or being locked by a separate member, the whole breechblock raises vertically in and out of locking engagement with a series of locking lugs spaced along the top of the receiver. Both ends of the breechblock are raised by two links pivoted fore and aft on the slide. The extractor is pivoted to the breechblock to allow for its vertical movement.

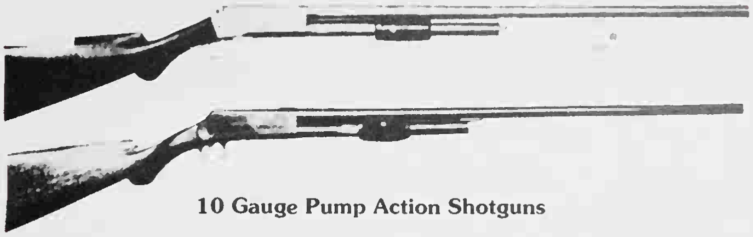
The fifth variant incorporates many of the features which later appeared in John M Browning's automatic shotguns and in many of the modern day shotgun designs. The locking block, assembled to and pivoting from the breechblock, is locked to the upper wall of the receiver. As with most modern shotguns, the hammer and trigger mechanism are part of an assembly which is fastened inside an opening at the bottom of the receiver.

The gun has a barrel takedown using interrupted threads with a takeup ring very similar to that used in the Browning .22 Semiautomatic Rifle. The magazine tube pivots to the barrel. When the rear of the magazine is disengaged from the receiver, the tube swings down and is used as a handle to thread the barrel in and out of the receiver.

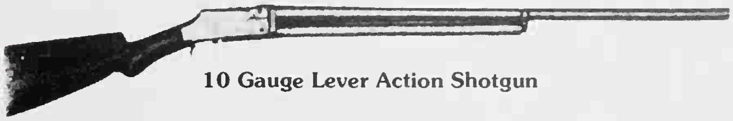
Pump Action Shotgun in 10 Gauge. This model has a tilting breechblock, which is pivotally mounted at the rear to the receiver. The front of the breechblock tilts down so far that the breechblock itself is used as a carrier, picking the cartridges up from tubular magazine with a 'tray' on top of the breechblock.

The breechblock pauses in its upward movement long enough for the extracting slide, which reciprocates longitudinally, to pick the cartridge off the top of the breechblock and force it into the chamber. The breechblock then completes its upward motion, ready for firing.

A second design, similar to this but differing in minor details, was also sold to, but not manufactured by, Winchester.

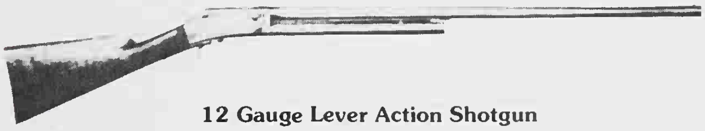


10 Gauge Pump Action Shotguns



10 Gauge Lever Action Shotgun

Lever Action Shotgun in 10 Gauge. This lever action shotgun has a tubular magazine and pistol grip. The finger lever, carrying the entire locking mechanism, is hung to the receiver by a link on the left hand side. The forward end of the link is hung on a pivot in the finger lever; the rear of the link on a pivot in the frame. The upper portion of the finger lever is guided by the receiver.



12 Gauge Lever Action Shotgun

Lever Action Shotgun in 12 Gauge. This shotgun has a tubular magazine and a one piece breechblock, trigger guard and lever combined. The breechblock works along a track on the side of the receiver, by means of a round pin visible at the front of the breechblock.

In working the lever, the greater part of the insides of the gun come out of the receiver with the lever. This, and the long lever throw, are two disadvantages of this extremely simple, rugged gun.

12 Gauge Pull Apart Shotgun

Pull Apart Shotgun in 12 Gauge. Another of John M Browning's pull apart firearms, it only handles the 12 gauge cartridge. A latch is positioned at the front of the trigger guard, to prevent accidental operation. The rear unit, which includes the trigger guard, has a lug projecting forward into the top of the receiver. The lug works on the rear of the breech bolt in such a way as to unlock it from the back of the frame.

In this model, the hammer and mainspring work inside a long tube attached to the receiver. The tube acts as a guide to keep the two essential parts—the stock and trigger assembly and the barrel and receiver assembly—in alignment when the gun is pulled apart.

Major
Through the

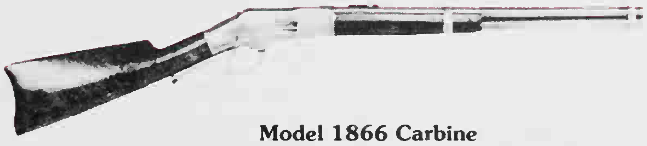
Western pioneers preferred the Model 1873 *(above)* for its rapid fire, rugged construction and reliability in all kinds of weather—qualities that made it ideal for short range hunting and skirmishes with Indians.

Winchesters Years

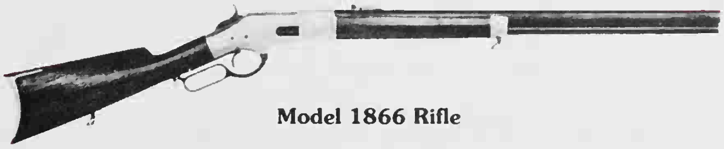
Oliver F Winchester knew that he had the first and best lever-action repeater in the world and did not mind extolling its virtues. In one of his letters, he asks the following historically pertinent questions.

'What would be the value of an army of one hundred thousand infantry and cavalry, thus mounted and armed with a due proportion of artillery, each artilleryman with a repeating carbine slung to his back?

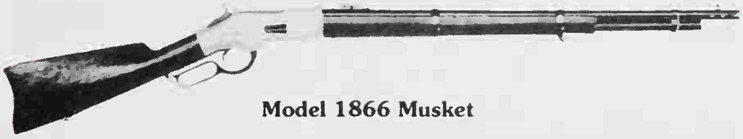
'Certainly the introduction of repeating guns into the army will involve a change of the Manual of Arms. Probably it will modify the art of war; possibly it may revolutionize the whole science of war. Where is the military genius that is to grasp this whole subject, and so modify the science of war as to best develop the capacities of this terrible engine—the exclusive control of which would enable any government (with resources sufficient to keep half a million of men in the field) to rule the world?'



Model 1866 Carbine



Model 1866 Rifle

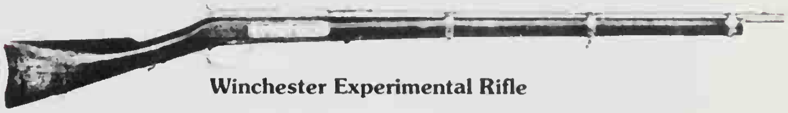


Model 1866 Musket

The Model 1866. This gun, the first truly operant lever action repeater, was invented by B Tyler Henry and is also known as the Henry Rifle. Various loading methods were developed and patented for the Model 1866 in both 1865 and 1866. Collectors have determined that at least four types of the 1866 were manufactured.

The first model has the Henry drop in the receiver ahead of the hammer, no flare to accommodate the fore end, an additional screw in the upper tang and an inside serial number. The second model has less drop ahead of the hammer and has the fore end flare. The third model has the drop ahead of the hammer but is less pronounced than the preceding two models and has an outside serial number usually in block numerals. The fourth model has slightly less drop in the receiver ahead of the hammer, and the serial number is usually in script numbers between the lever latch and the lower tang screw.

Winchester submitted a specially made Model 1866 to the Army trials in February of 1873. Although this Winchester did not pass all of the tests satisfactorily, it should be noted that none of the repeaters present passed the test. When one considers the details of the testing procedure, one can see why. The first test examined rapidity with aim—the number of shots fired in one minute that strike a target six feet by two feet, at a distance of 100 feet.



Winchester Experimental Rifle

The second tested rapidity at will—the number of shots that can be fired in one minute, irrespective of aim. The third tested endurance. Each gun had to fire 500 continuous rounds, without cleaning, and then the state of the breech mechanism was examined at the end of every 500 rounds. The fourth tested performance with defective cartridges. Each gun was fired once with cartridges that had been cross-filed on the head to nearly the thickness of the metal, cut at intervals around the rim and had a longitudinal cut the whole length of the cartridge from the rim up.

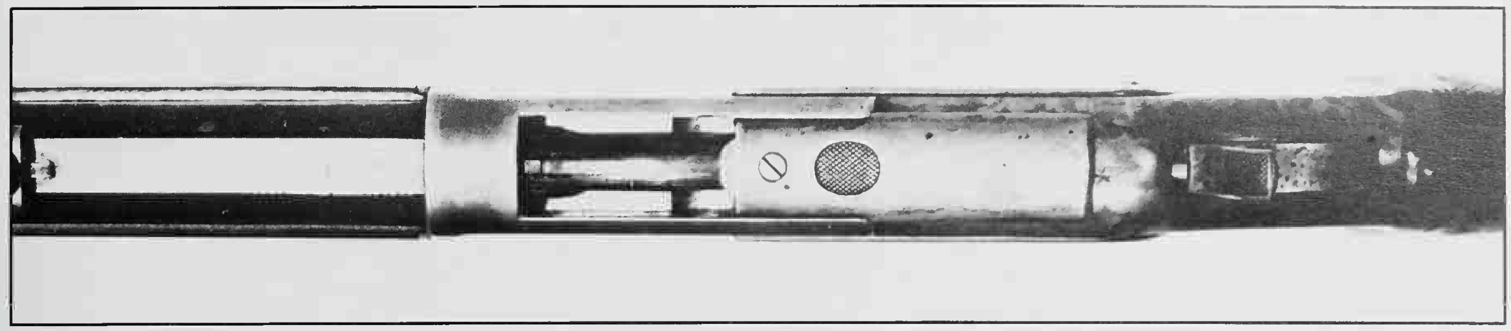
The fifth tested performance under dusty conditions. The gun was placed in a box and exposed to a blast of fine sand dust for several minutes; it was removed from the box, fired 50 rounds, replaced for 5 minutes, removed and fired 50 rounds more. The sixth test examined performance under rusty conditions. The breech mechanism and receiver were cleaned of grease; the chamber of the barrel was then greased and plugged, and the butt of the gun inserted to the height of the chamber in brine for 10 minutes, exposed for 2 days to the open air standing in a rack, and then fired 50 rounds.

The seventh, and final test, examined performance firing overloads. The gun was fired once with 86 grains of powder and one lead ball weighing 450 grains; and again, with 90 grains and one ball; and once again with 90 grains and two balls. The firearm was closely examined after each discharge.

Benito Juarez bought at least 1000 Model 1866s for use in his war with Emperor Maximilian of Mexico. Turkish contracts in 1870 and 1871 accounted for 46,000 muskets and 5000 carbines. The French government also bought 3000 muskets and 3000 carbines from Winchester, and Chili and Peru cooperatively bought a large consignment of 1866 Winchesters at a cost of about $90,000. The Model 1866 was officially discontinued in 1898. Peak production of over 35,000 units had been achieved in 1871.

Model 1873 Carbine

The Model 1873. The Model 1873 is the Winchester best known to collectors and the public alike. Although a tremendous number of variations were produced, collectors have designated at least four separate model types of the '73,' each distinguished by minor structural alterations. The first Model 1873s were manufactured with an iron frame



which was later replaced with one of steel, resulting in a lighter gun and lower production costs. A bright blue finish was the standard for the Model 73, with trigger, hammer, lever and internal parts casehardened for greater durability and to minimize wear.

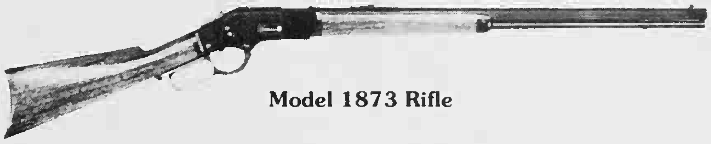
Of particular interest to collectors is a 'cutaway' display Model 73 which was produced in the Winchester Model Shop. This 'cutaway' version featured sectional cuts that enabled Winchester salesmen to show the inner workings of the gun at fairs, exhibits and other public gatherings. Of the few that were produced, no two were sectioned in the same manner.

An interesting, if often misunderstood, variation of the Model 1873 is the 'One of One Thousand.' This version was announced as follows in the 1875 catalog:

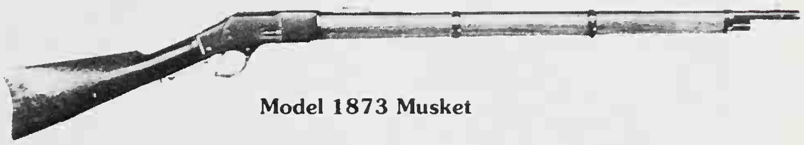
'It is the purpose of the manufacturers of these arms to introduce a greater variety than has heretofore been made, to meet the different purposes and uses to which they are applicable, whether for sporting or war. Among these, the demands of amateur sportsmen are the most exacting for an arm that will shoot with unerring accuracy.

'With the perfect machinery and great skill of the men we employ in boring, rifling, straightening, polishing and finishing our barrels, we can always count with confidence upon any

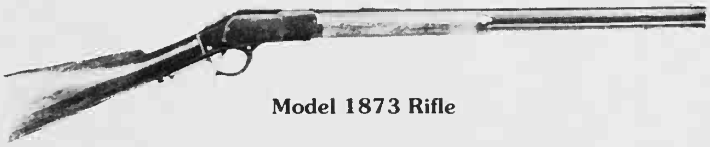
***At bottom:* The Model 66 Carbine. *At top:* The Model 1873 Special Sporting Rifle. For shooters who wanted a premium gun—the Model 1873 One of One Thousand. To collectors of antique firearms, this model is probably the most valuable of all American shoulder arms. *Above:* Detail of barrel marking on a Model 1873 One of One Thousand.**



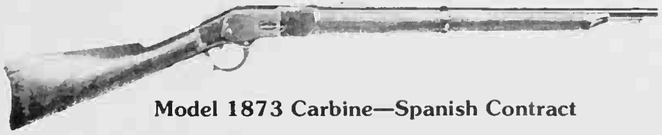
Model 1873 Rifle



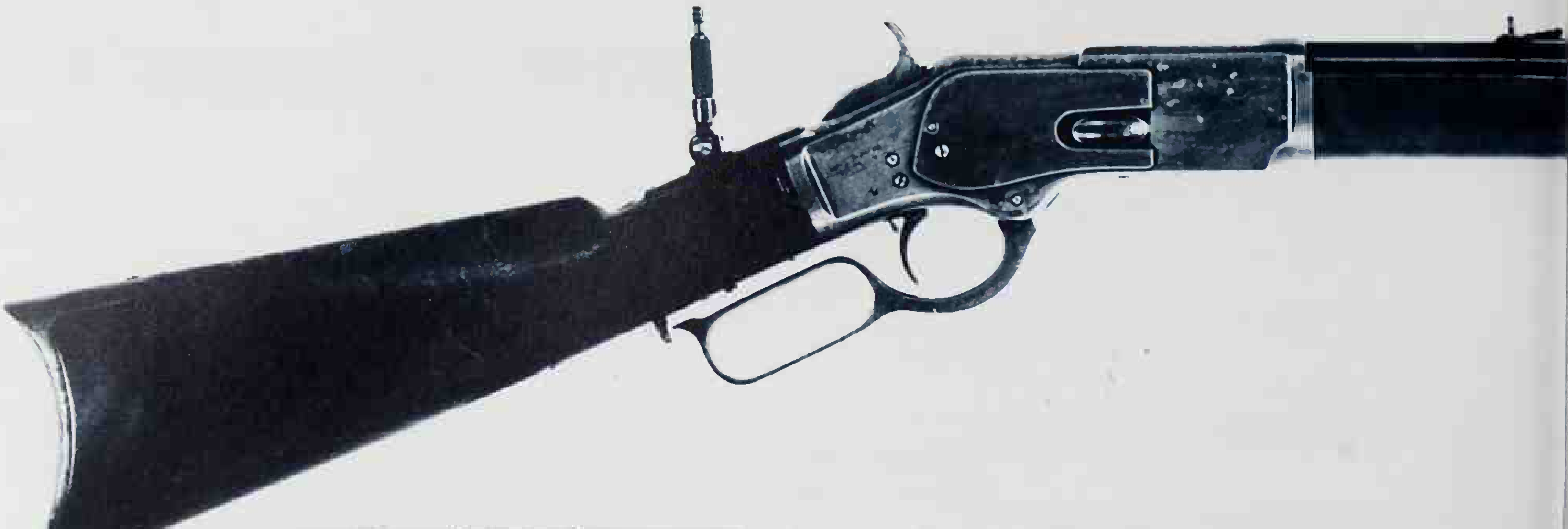
Model 1873 Musket



Model 1873 Rifle



Model 1873 Carbine—Spanish Contract



Above: **The Model 1873 One of One Thousand, one of the rarest and finest of the Wild West Winchesters. *Left:* The infamous Billy the Kid poses with his lever action repeater. *Right:* Two Indian scouts—one holding a Model 1876—and an Indian school boy, circa 1880.**

barrel shooting with accuracy; but in this as in all other cases, the degree of accuracy will vary. The barrel of every sporting rifle we make will be proved and shot at a target, and the target will be numbered to correspond with the barrel and be attached to it.

'All of the barrels that are found to make targets of extra merit will be made up into guns with set triggers and extra finish and marked, as a designating name, One of One Thousand.'

By 1877, the One of One Thousand was dropped from the catalog but not before a total of 136 of these firearms were produced. Although only 36 of these guns have been found to date, it is believed by most collectors that others are still somewhere in circulation.

The year 1891 saw the greatest Model 73s produced, when over 41,000 were manufactured. Production ceased in 1923 after over 700,000 had been produced.

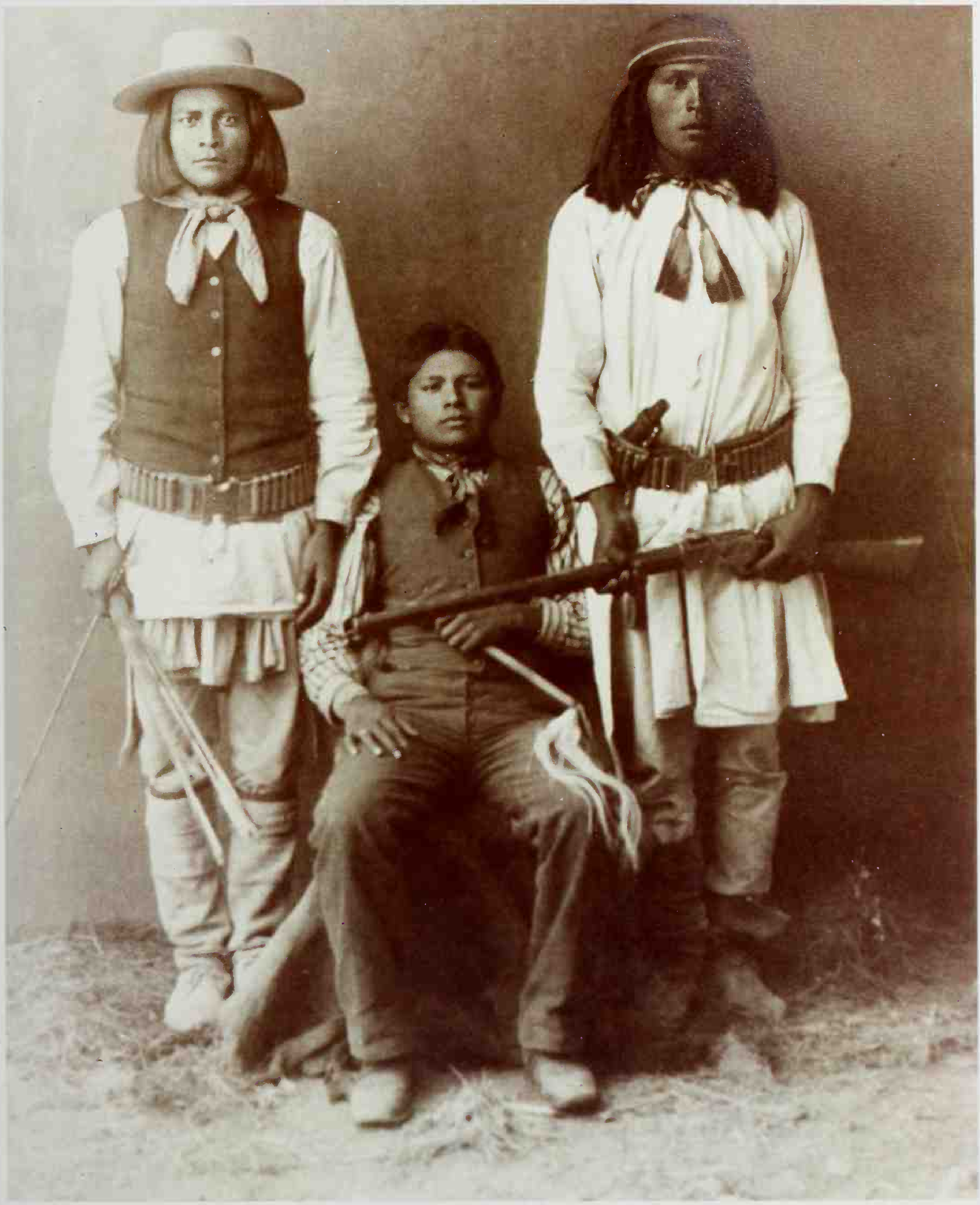
Model 1876 Carbine

Model 1876 Rifle

The Model 1876. After the introduction of the Model 1873, Winchester conceded that 'the constant calls from many sources, and particularly from the regions in which the grizzly bear and other large game are found, as well as the plains where absence of cover and shyness of game require the hunter to make his shots at long range, made it desirable to build a still more powerful gun than the Model 1873.'

In 1876, at the Philadelphia Centennial Exposition, the Model 1876 first appeared. It was immediately christened the 'Centennial Model,' commemorating the anniversary of the Revolutionary War. The Model 1876 is essentially the same as the Model 73, but is built heavier, to handle the .45-75 WCF cartridge.

In 1886, production of the Model 76 was discontinued, but the last rifle did not leave the factory until over 10 years later. Production figures indicate that a little over 63,000 of



these rifles were manufactured, with most of them having been sold to the Royal Canadian Mounted Police, who used them in the Indian conflicts of Western Canada around the turn of the century. By 1905, the Model 76 had been retired from duty with the Mounties, but not before it had carved a record for dependability and ruggedness. The peak production year was 1884, when over 12,000 were manufactured.

The Model 71. The Winchester 1871, a continuation of the Model 1886, commenced production in 1935. This rifle was chambered only for the .348 Winchester, for which varying bullet weights of 150, 200 and 250 grains were offered. A 24-inch barrel, an open sporting or peep rear sights and hooded front ramp sights were standard. The Model 71 was available in 'Standard Rifle' and 'Deluxe Rifle' grades with the 'Deluxe' having sling loops and slings, a pistol grip cap and checkering. By the time the Model 71 was discontinued in 1958, over 47,000 had been produced.

The Model 53. The Model 53 was introduced in 1924 as a continuation of the Model 1892. Chambered for .25-20, .32-20 and .44-40 cartridges, this rifle has a 22 inch round barrel, a six shot magazine, straight grip and shotgun style butt plate. The Model 53 is considered by collectors to be a rare gun since it was discontinued in 1932 and only about 25,000 were actually produced over a period of 10 years.

The Model 65. Another continuation of the Model 1892, the Model 65 features a shotgun butt stock, uncapped pistol grips and a semi beavertail fore end. The barrel is tapered, generally 22 inches long and the magazine holds seven shots. The Model 65 is chambered for the .218 Bee, the .25-20, and .32-20 cartridges. A total of less than 6000 were manufactured from 1933 to 1947.

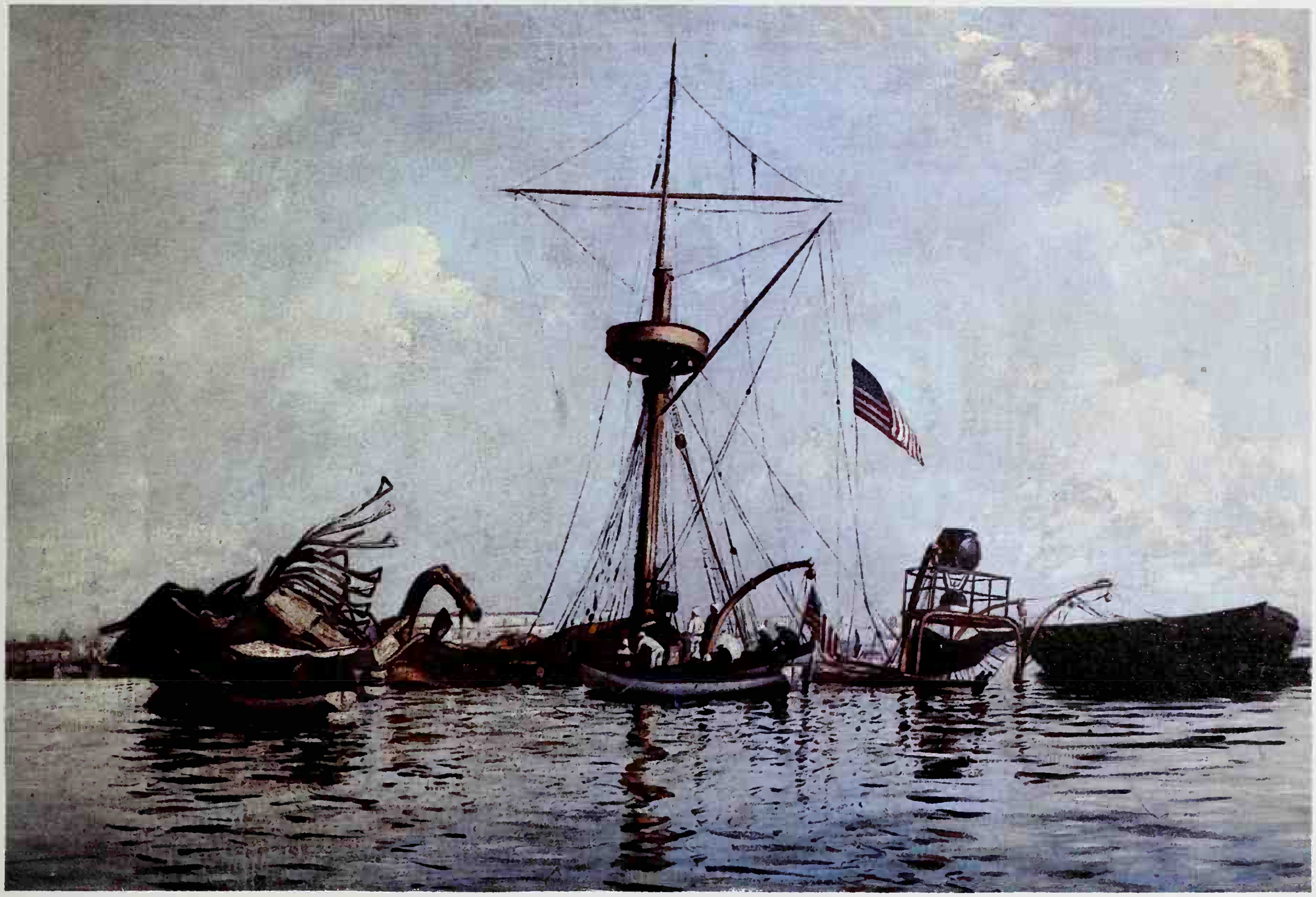
The Model 1901. The Model 1901 is a lever action shotgun made for smokeless powder loads and available only in 10 gauge. Its barrel length is 32 inches, with a standard blued overall finish. The Model 1901 did not sell well, principally because the relatively new slide action shotguns of the period were proving themselves far more popular.

The Model 1901 has some safety features, among them a trigger block and a mechanically operated firing pin retractor, both of which prevent accidental discharge. Manufacture of the Model 1901 ceased in 1920, and the remaining guns on hand were shipped to Mexico in the early 1930s.

The Model 64. The Model 64 is a long-lived and very popular continuation model which utilized John M Browning's Model 1894 action. It was introduced in 1933, and was chambered for various cartridges including the .25-35, the .30-30, the .32 Winchester Special and the .219 Zipper. A rapid taper 24-inch barrel is standard, with ramp type front sights. Manufacture of the Model 64 ceased in 1956 but was resumed in 1970.

The Lee Model Winchester. The Lee Winchester is a bolt action rifle which uses a slight upward and then rearward

Left: A serious Gary Cooper (photo far left), appearing in the 1950 movie *Dallas*, keeps his Winchester Model 1876 close by his side. The Model 76 was introduced to fill the need for a powerful, long range rifle.



Above: **The wreck of the *Maine*, with Winchesters aboard. *At left:* For over 50 years, the Model 73 Lever Action Repeating Rifle was one of the most popular rifles produced by Winchester.**

pull of the bolt. This type of action is both fast and dependable. Only about 20,000 Lee 'straight pull' models were produced and of these only a small number were fitted as sporting rifles.

Although it had been in use by US Armed forces for many years, sportsmen found it less desirable than most lever actions. The majority of Lee Winchesters—in musket configuration—were sold to the Navy and saw duty in the Spanish-American War. Apparently, a large number of these Lee muskets were on board the *Maine* when it was sunk in Havana Harbor. About 50 of these rifles were recovered from the ship, and were later sold by a New York arms dealer. Manufacture of the Lee Model was discontinued in 1902.

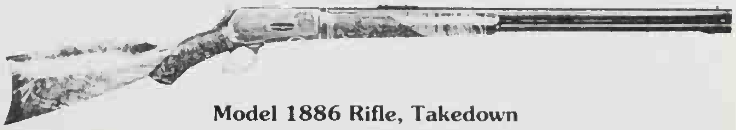
The Model 1898 Winchester Cannon. While the Winchester Cannon is not a true gun because it does not fire projectiles, it has nonetheless proved to be a crowd pleaser for the general public, as well as being a sought-after collectors' item. The cannon is made for 10 gauge black powder blanks only, and the barrel is marked 'Not for Ball.' The earliest of these cannons were made with enamelled metal surfaces and had steel wheels. On later models, rubber tires and chrome plated metal parts were also available at extra cost. The cannons were designed primarily as a starter or salute guns and so were in limited demand. However, nearly 19,000 had been manufactured before they were discontinued in 1958.

Winchester-Western Rifles

Winchester Model 73 Lever Action Repeating Rifle. The Model 73 is chambered for .32-20, .38-40 and .44-40 cartridges. Over 720,000 rifles of this model were manufactured from 1873 to 1924.

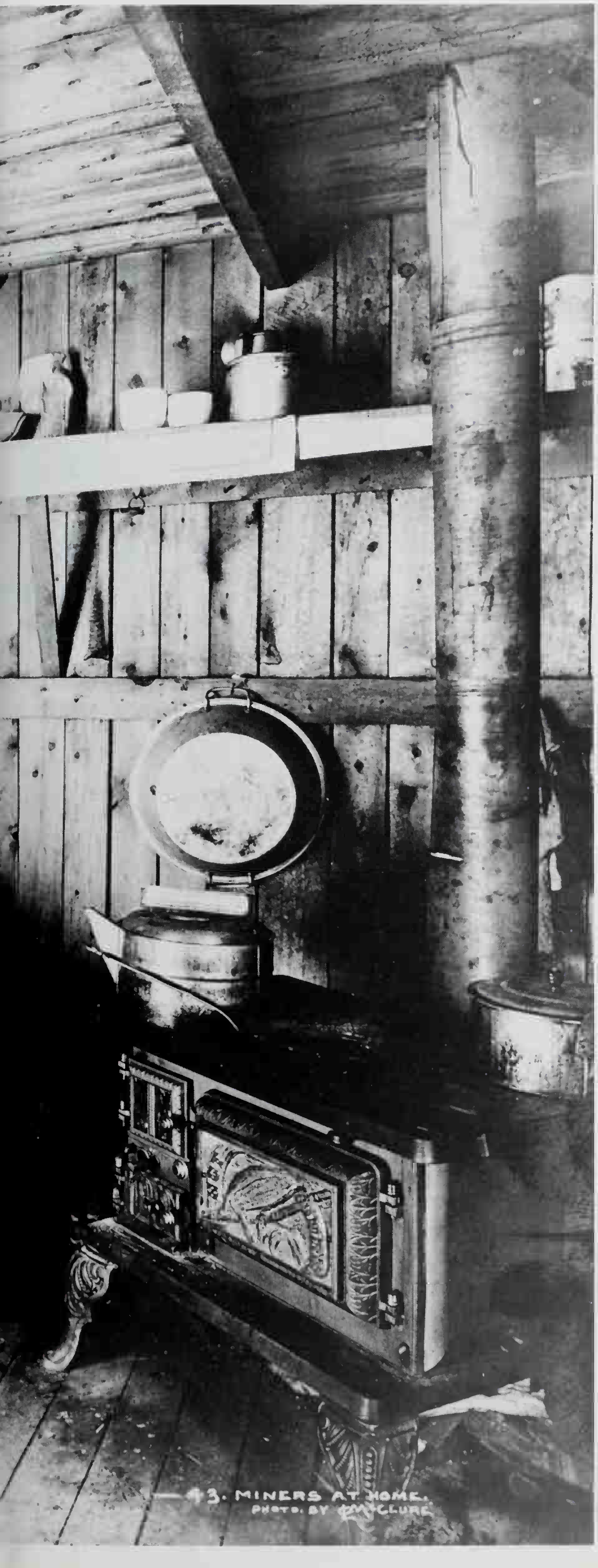
Winchester Single Shot Rifle. Designed by John M Browning, this firearm was manufactured from 1885 to 1920 in a variety of models and chambered for most of the popular cartridges of the period, rimfire and center fire, from .22 to .50 caliber. See also the description in the 'Major Browning Winchester Models' section of this text.

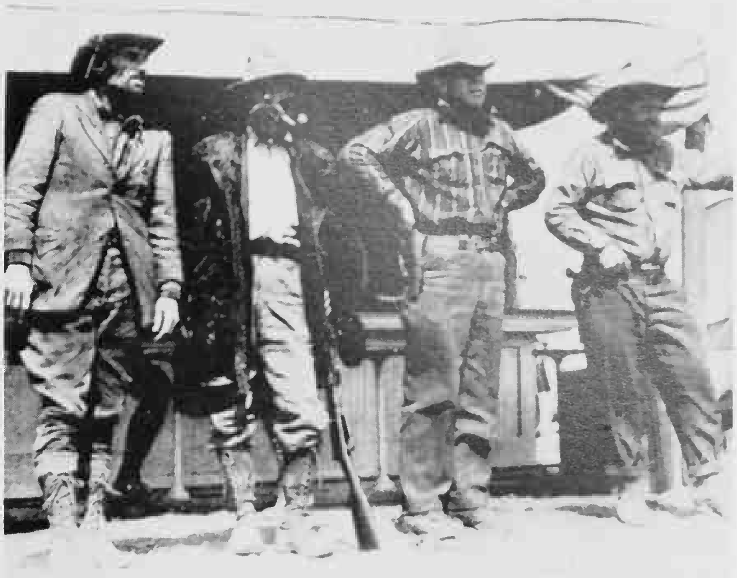
Model 1886 Rifle, Takedown



Model 1886 Rifle, Takedown

Winchester Model 86 Lever Action Repeater. Available in solid frame or takedown style, this rifle was made from 1886 to 1935. It is a lever action repeating rifle chambered for .45-70, .38-56, .45-90-300, .40-82-260, .40-65-260, .38-56-255, .38-70-255, .40-70-330, .50-110-300, .50-100-450 and .33 caliber. See also the description in the 'Major Browning Winchester Models' section of this text.





Winchester Model 90 Slide Action Repeater. The Model 90 is a pump action rifle that was chambered for the .22 short, long and .22 long rifle, and the .22 Winchester rimfire cartridge. It was manufactured from 1890 to 1932. See also the description in the 'Major Browning Winchester Models' section of this text.

Winchester Model 92 Lever Action Repeating Rifle. A solid frame or takedown, the Model 92 is chambered for .25-20, .32-20, .38-40 and .44-40 cartridges. It was made from 1892 to 1941. See also the description in the 'Major Browning Winchester Models' section of this text.

Winchester Model 53 Lever Action Repeating Rifle. A modification of the Model 92, this rifle of .25-20, .32-20 or .44-40 caliber was made from 1924 to 1932.

Winchester Model 65 Lever Action Rifle. Manufactured from 1933 to 1947, this design represented an improved version of the Model 53 in .25-20 and .32-20 calibers.

At left: **A vintage photo of miners in their Colorado Gold Rush cabin, with at least one Winchester against the wall.** ***Above:*** **Cowhands and a Winchester in Weepah, Nevada in 1927.** ***Below:*** **A Winchester-wielding desperado in the motion picture** ***A Fistful of Dollars.***

Special Features

Winchester went to great lengths to please its customers by offering a variety of special order features for their guns in almost every conceivable price range and taste spectrum. Some of these special features were available for only a short time, while others were listed in Winchester catalogs for many years. Some features were standard on one type of gun but were listed as options on other types.

Variations in barrel style and length are just one example of the special features available. Round barrels were standard for all lever action Winchester rifles, but any customer could order an octagonal barrel at additional charge.

'Extra heavy' target barrels were provided for some models and these, whether round or octagonal in shape, were available in any length up to 36 inches. These rifles with heavy barrels were sometimes known as 'Buffalo Rifles.' For a time Winchester offered 'extra light weight' rifles in certain models but these did not prove to be as popular as the standard rifles. If the customer so desired, he could order his rifle with the front half of the barrel rounded and the rear portion octagonal in shape—which provided a finer overall balance in the gun.

The types, sizes, variations and designs of sights available for Winchester guns are no less than legion. They include 'The Winchester Express,' 'The Rocky Mountain Front Sight,' 'The Knife Blade,' 'The Marbles Improved Sight,' 'The Beach Combination Sight,' 'The Vickers-Maxim Sight,' 'The Globe Sight,' 'The Lymans Patent Windgauge Front Sight,' 'The Marbles Duplex,' 'The Caterpillar,' 'The Military Wind Gauge Sight,' 'The Flexible Rear Sight,' 'The Combination Tang Peep Sight,' 'The Mid Range Vernier Peep Sight' and 'The Spirit Lever Sight.'

Winchester even manufactured, for a while, telescopic scopes of high quality with five different reticles in three, four and five power. If a customer wanted a nonglaring sighting plane, he could order a matted barrel in either cross checkered or weaving lines design.

Smoothbore barrels could be ordered if the customer wanted to use shot cartridges. These smoothbore guns were mainly made for exhibition shooters, and were available in a wide variety of calibers. Various rifling twist combinations were also available upon request. Winchester, for many years, ran the following discussion of rifling in its catalogs.

'One of the most difficult things to determine in making rifle barrels is the twist, or rifling, required to shoot a given cartridge to best advantage. Cartridges of different or like caliber containing different weights of powder or lead require a different twist. A proper twist is one which will spin a bullet fast enough to keep it point on to the limit of its range, thus insuring the best possible accuracy.

'If the twist is too slow the flight of the bullet will be untrue, and it will "tumble" or "keyhole," as it is called when a bullet passes through the air in a lengthwise position instead of point on. On the contrary, if the twist is too quick or sharp the bullet will spin so rapidly that it is unsteady in its flight and wobbles like a top when it first begins to spin.

'The only sure way of ascertaining a perfect twist is by calculation and exhaustive practical tests. The Winchester Repeating Arms Company have complete facilities for verifying all calculations for twist, which enables them to determine with positive certainty the twist that will give best results with a given cartridge.'

These special order riflings could be ordered in basically three types—the Medford, the Whitworth or the Alexander Henry, as well as other more exotic styles. Winchester also offered a number of different devices intended to reduce the rifle's blast noise. Other devices were offered to reduce its recoil; these and other options were fitted upon request.

Most Winchesters had stocks made of selected straight grain American walnut. While American walnut was the standard, other woods such as English, Italian, or other imported walnuts, maple (either curly or bird's eye), orangewood or other fruitwoods such as cherry and peach, could be special ordered.

Winchester employed a rigid system of stock grading which included four basic categories—the grain flow of the wood (which was designated as either straight or fancy); the density of the wood (which had a great bearing on the kind of carving or checkering ultimately performed on it); the contrast or grain of the wood (which mainly had to do with its color and shading); and the fitting and finishing of the wood.

Winchester's checkering and carving were generally divided into eight different styles denominated A through H. Styles A and B consisted of carving, while a moderate amount of border carving was used with style C. Style D incorporated carving—usually of oak leaves and acorns—and style E was generally a tasteful combination of checkering and carving. Styles F, G and H carried progressively less carving, and style H (the lowest priced) carried only checkering.

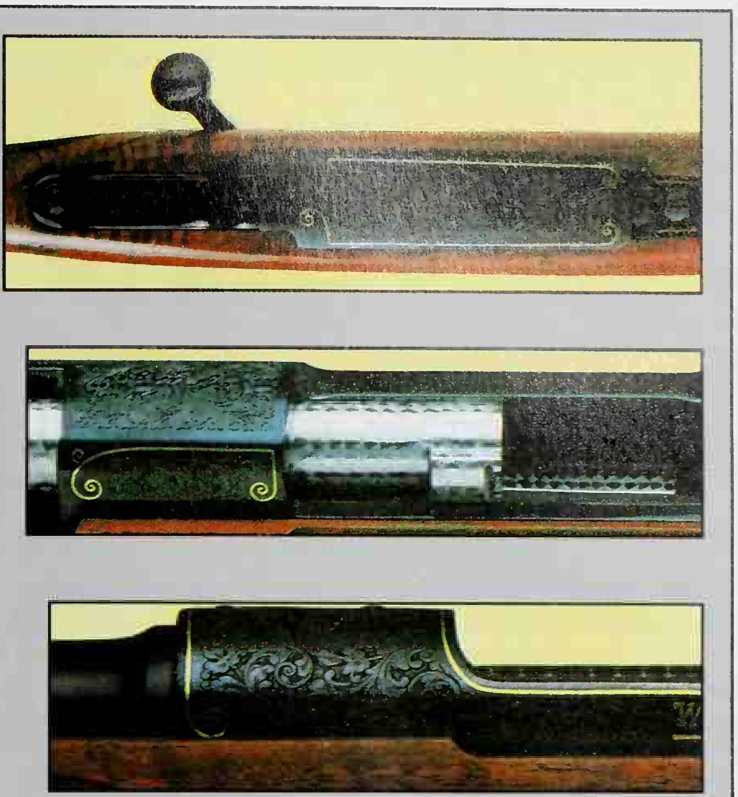
In addition, Winchester offered color casehardening of receivers and butt plates as well as hammers and levers. During this process, the parts were packed in airtight cylinders with a combination of bone meal and leather dust heated to a red hot temperature. The parts were then quenched quickly in water. The quenching step actually controlled the colors that would appear, in an iridescent shimmer on the metal so tempered.

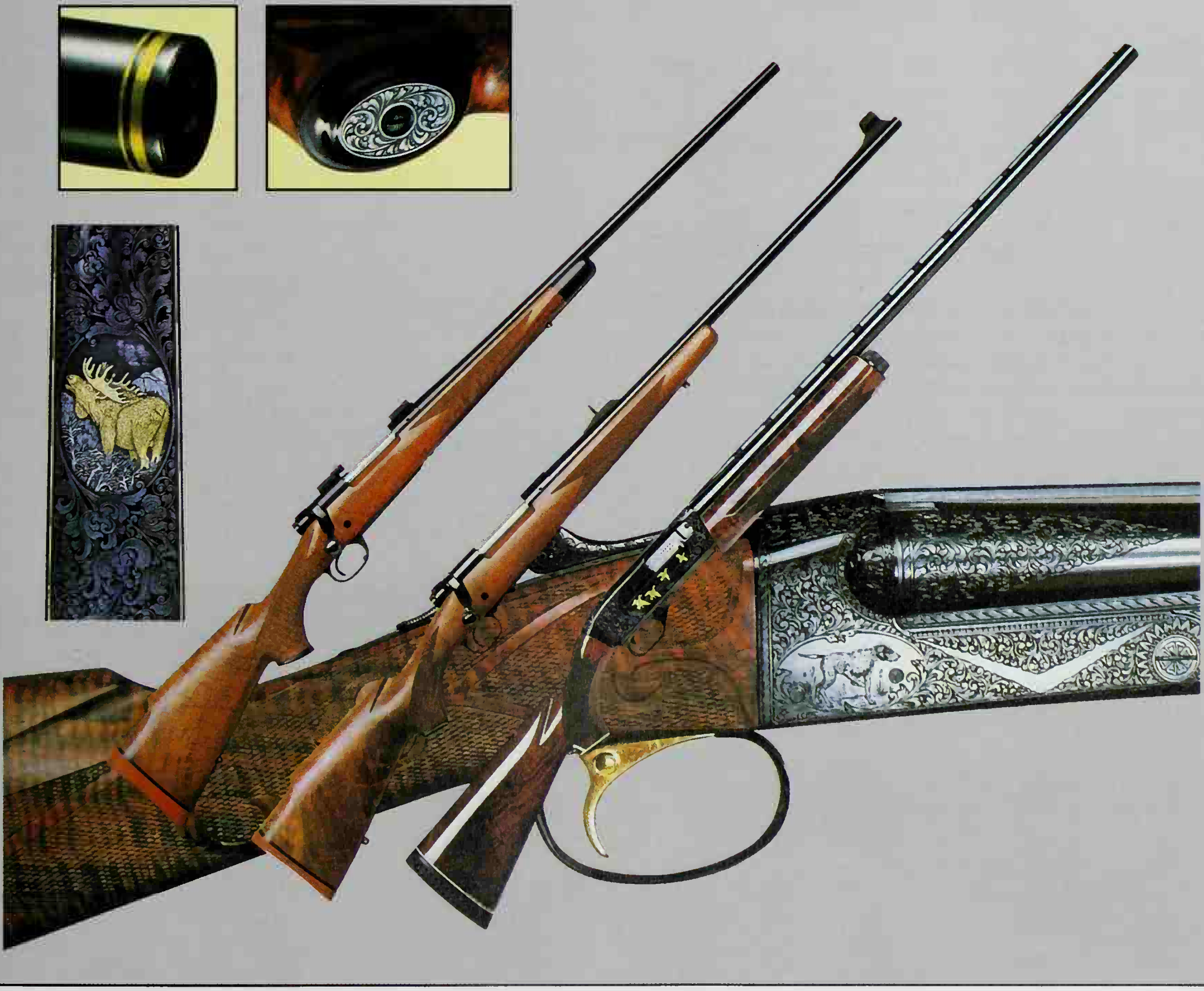
Plating in gold, silver, nickel and chrome was offered on many models. Winchester engraving was generally priced according to coverage and quality, and ranged through 10 grades, although the quality of the workmanship varied slightly from grade to grade. Various scenes were offered in standard patterns, but the customer could have an illustration from a photograph duplicated to his taste. Both American and English scrolls were employed in Winchester engraving, and inscriptions on the engraved gun were done in a variety of patterns consisting of names, dates or other pertinent information.

Also, gold, silver or platinum bands could be inlaid on engraved barrels or receivers if ordered. 'Engraving' means that the lines are cut into the metal, penetrating the surface. 'Inlay work' means that a precious metal is used to fill in the engraved grooves, and 'sculptured designs' refer to precious metal designs that are raised above the surface of the firearm. More often than not, the term 'inlay work' is used to include 'sculptured designs.' The engravers who worked for Winchester have in the past been allowed to choose their own patterns, provided the engravers had sufficient expertise to carry it off, or they could follow the basic styles that were offered in the current catalogs.

Figures of deer have been, by far, the most popular designs—with standing, drinking, listening and pausing stances generally the most used. The elk has also been a popular animal as well as moose, mountain goat, bear and antelope. Some kinds of buffalo and hunting dogs have also been pictured, but these are considered rare animals on older Winchesters, as are scenes which contained more than one animal.

Finally, Winchester has offered extra parts that could be special ordered for various firearms. For example, saber bayonets of 25 inches in length were offered for a number of Winchester muskets, as well as matching leather scabbards with brass fittings. Winchester has also offered saddle rings for firearms.

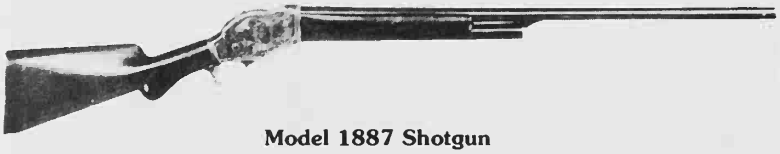




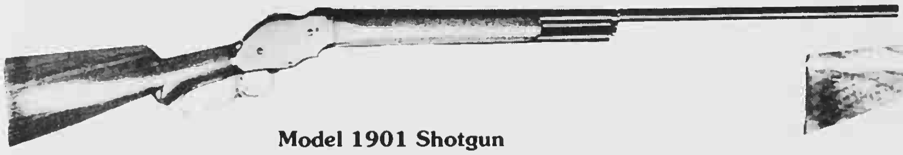
Custom work from Winchester—*right, from top down:* An engraved trigger guard and floor plate; a hand-jewelled bolt and magazine follower; and a hand-engraved receiver with gold inlay. *Below, left and right:* gold inlaid muzzle band and an engraved pistol grip cap. *At bottom, left to right:* Model 70 Exhibition Grade; Model 70 Custom Built; and a Super-X Model 1 Shotgun.

Winchester-Western Shotguns

Winchester Model 1887 Lever Action Repeater. Made from 1887 to 1901, the Model 1887 is a solid frame 10 or 12 gauge shotgun with a four shot tubular magazine. It has a plain 30- or 32-inch barrel, with full choke, and a plain pistol grip stock. It weighs nine pounds in 10 gauge and eight pounds in 12 gauge. See also the description in the 'Major Browning Winchester Models' section of this text.



Model 1887 Shotgun

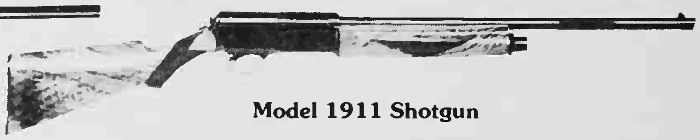


Model 1901 Shotgun

Winchester Model 1901 Lever Action Repeater. The Model 1901 is a redesigned version of the Model 1887, and has the same general specifications. It is available in 10 gauge only and was made from 1901 to 1920.

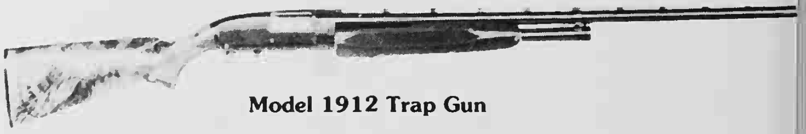
Winchester Model 97 Slide Action Repeating Shotgun. The Model 97 is a standard grade, takedown or solid frame pump action shotgun in 12 or 16 gauge, with a five shell tubular magazine. Available with barrel lengths of 26 to 32 inches, it weighs about 7.75 pounds and has a plain pistol grip stock and grooved slide handle. This firearm was manufactured from 1897 to 1957. See also the description in the 'Major Browning Winchester Models' section of this text.

Winchester Model 1911 Autoloading Shotgun. The Model 1911 is a hammerless, takedown semiautomatic shotgun in 12 gauge only, with a four shell tubular magazine. It weighs about 8.5 pounds and was made from 1911 to 1925. It should be noted that John M Browning invented the autoloading—or, 'automatic'—shotgun.



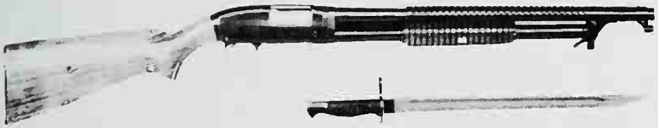
Model 1911 Shotgun

Model 1912 Shotgun



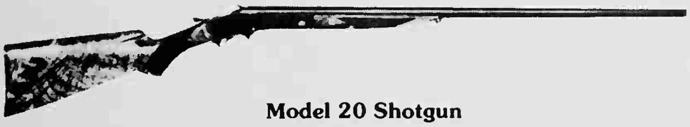
Model 1912 Trap Gun

Winchester Model 12 Standard Slide Action Repeating Shotgun. The Model 12 is a hammerless, takedown pump action shotgun in 12, 16, 20 or 28 gauge, with a six shell tubular magazine and barrel lengths of from 26 to 32 inches with full to cylinder chokes. It weighs about 7.5 pounds and was made from 1912 to 1964.



Model 1912 Trench Gun

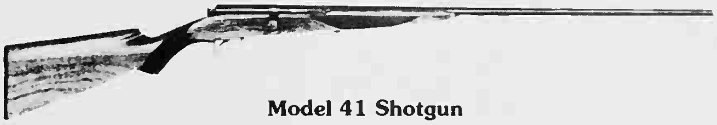
Winchester Single Shot Lever Action Shotgun. Like the Single Shot Rifle, this 20 gauge shotgun has a falling block action, with a high wall receiver. Available in solid frame or takedown, it has a 3-inch chamber, a 26-inch barrel and weighs about 5.5 pounds. This firearm was manufactured from 1914 to 1916.



Model 20 Shotgun

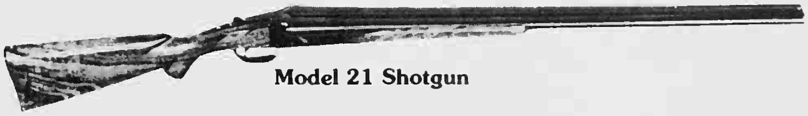
Winchester Model 20 Single Shot Hammer Gun. The Model 20 is a takedown single shot shotgun chambered for a .410 gauge, 2.5 inch shell. It has a 2-inch barrel with a full choke and was made from 1919 to 1924.

Winchester Model 36 Single Shot Bolt Action Shotgun. The Model 36—a single shot, takedown firearm—uses 9mm short or long, shot shells or 'pumpkin ball' cartridges interchangeably. It weighs about three pounds and was made from 1920 to 1927.



Model 41 Shotgun

Winchester Model 41 Single Shot Bolt Action Shotgun. The Model 41 is a single shot, takedown shotgun chambered for a .410 gauge, 2.5-inch paper shot shell. It has a 24-inch barrel with full choke and was made from 1920 to 1934.

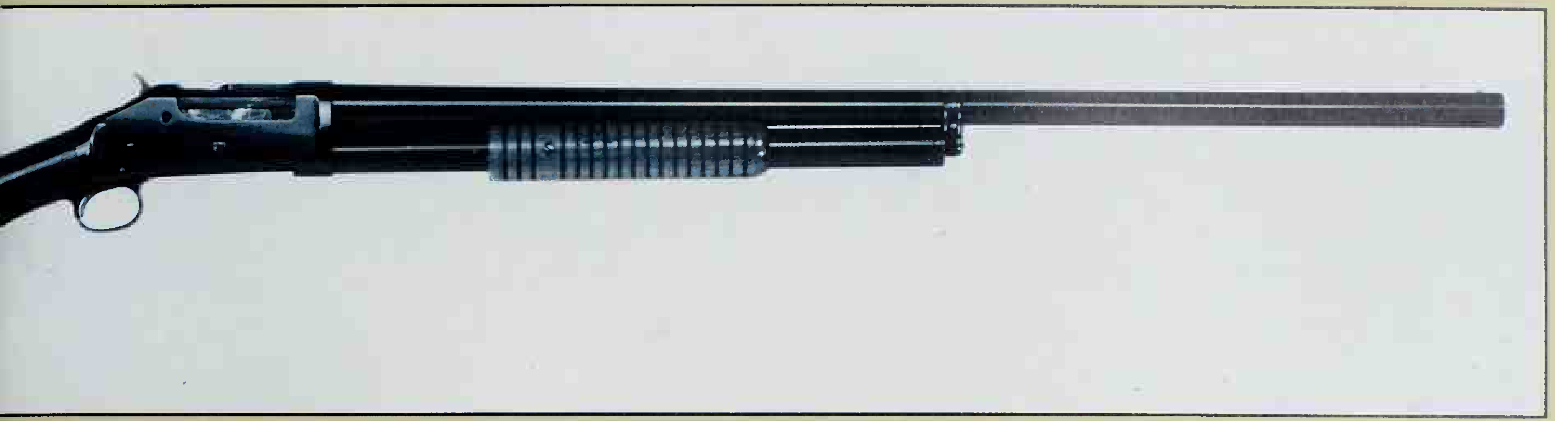


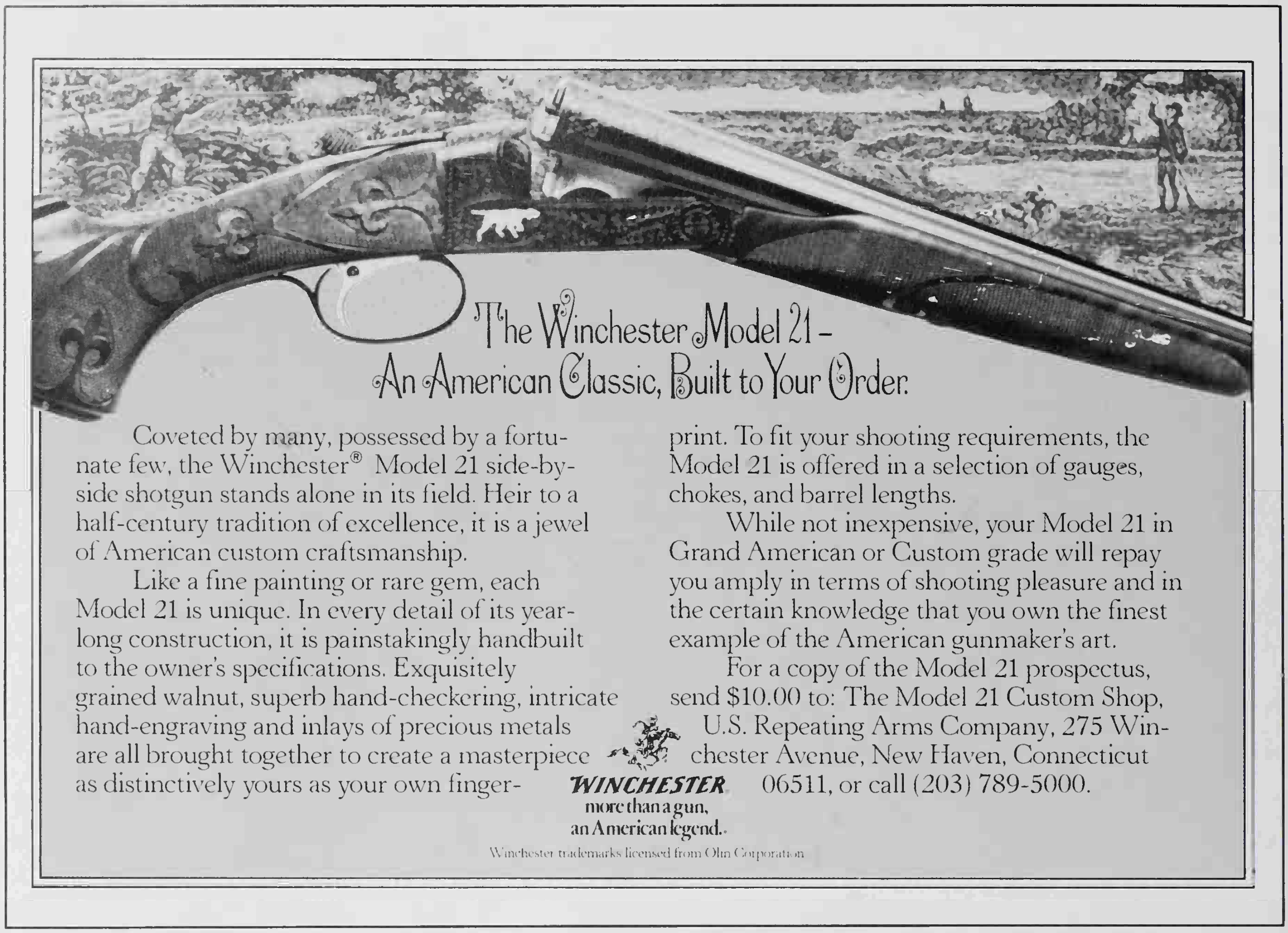
Model 21 Shotgun

Winchester Model 21 Double Barrel Field Gun. The Model 21 is a hammerless, box lock double barreled shotgun with an automatic safety. Made in 12, 16 and 20 gauge, it is available with double triggers or a selective single trigger, and selective or nonselective ejection. This gun was made from 1930 to 1958.

***At top:* The Model 97 became the standard against which other shotguns were judged. *At bottom:* The Model 1911 Autoloading Shotgun. John M Browning was the genius behind this revolutionary design.**

The Model 93 Shotgun *(far right)* was the forerunner of the Model 1897 Shotgun *(above and below)*. The Model 97's refinements corrected a number of weaknesses in the Model 93. The most notable modification was an improved slide lock which kept the gun locked until it was fired, thereby preventing the gun from jamming in case of a misfire.





The Winchester Model 21 – An American Classic, Built to Your Order.

Coveted by many, possessed by a fortunate few, the Winchester® Model 21 side-by-side shotgun stands alone in its field. Heir to a half-century tradition of excellence, it is a jewel of American custom craftsmanship.

Like a fine painting or rare gem, each Model 21 is unique. In every detail of its year-long construction, it is painstakingly handbuilt to the owner's specifications. Exquisitely grained walnut, superb hand-checkering, intricate hand-engraving and inlays of precious metals are all brought together to create a masterpiece as distinctively yours as your own fingerprint. To fit your shooting requirements, the Model 21 is offered in a selection of gauges, chokes, and barrel lengths.

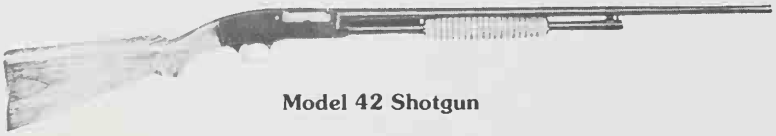
While not inexpensive, your Model 21 in Grand American or Custom grade will repay you amply in terms of shooting pleasure and in the certain knowledge that you own the finest example of the American gunmaker's art.

For a copy of the Model 21 prospectus, send $10.00 to: The Model 21 Custom Shop, U.S. Repeating Arms Company, 275 Winchester Avenue, New Haven, Connecticut 06511, or call (203) 789-5000.

WINCHESTER
more than a gun,
an American legend.

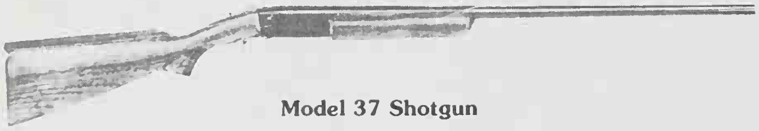
Winchester trademarks licensed from Olin Corporation

Winchester Model 21, Grand American. Since 1959, the Model 21 has been offered only in deluxe models on special order. Each of these custom guns has a full fancy American walnut stock and forearm with fancy checkering, finely polished and hand smoothed working parts with engraved inlays, carved stocks and other extras available at additional cost. Made from 1960, these have been among Winchester's presentation best at a cost of about $10,000.



Model 42 Shotgun

Winchester Model 42 Standard Slide Action Repeating Shotgun. The Model 42 is a hammerless, takedown shotgun in .410 guage. The tubular magazine holds five 3-inch or six 2.5-inch shells. Made from 1933 to 1963, it weighs about six pounds.

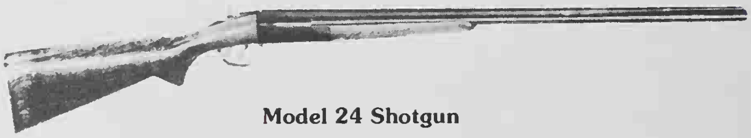


Model 37 Shotgun

Winchester Model 37 Single Barrel Shotgun. The Model 37 is semi-hammerless, takedown shotgun in 12, 16, 20, 28 and .410 gauge with automatic ejection. It was made from 1937 to 1963.

From the first firearms manufactured by the New Haven Arms Company *(right)*, Winchester has maintained a standard of excellence, as is illustrated by the custom built Model 21 seen in the advertisement *above*.

Winchester Model 370 Single Barrel Shotgun. The Model 370 is a takedown shotgun in 12, 16, 20, 28 and .410 gauge with automatic ejection. This firearm was produced from 1968 to 1973.

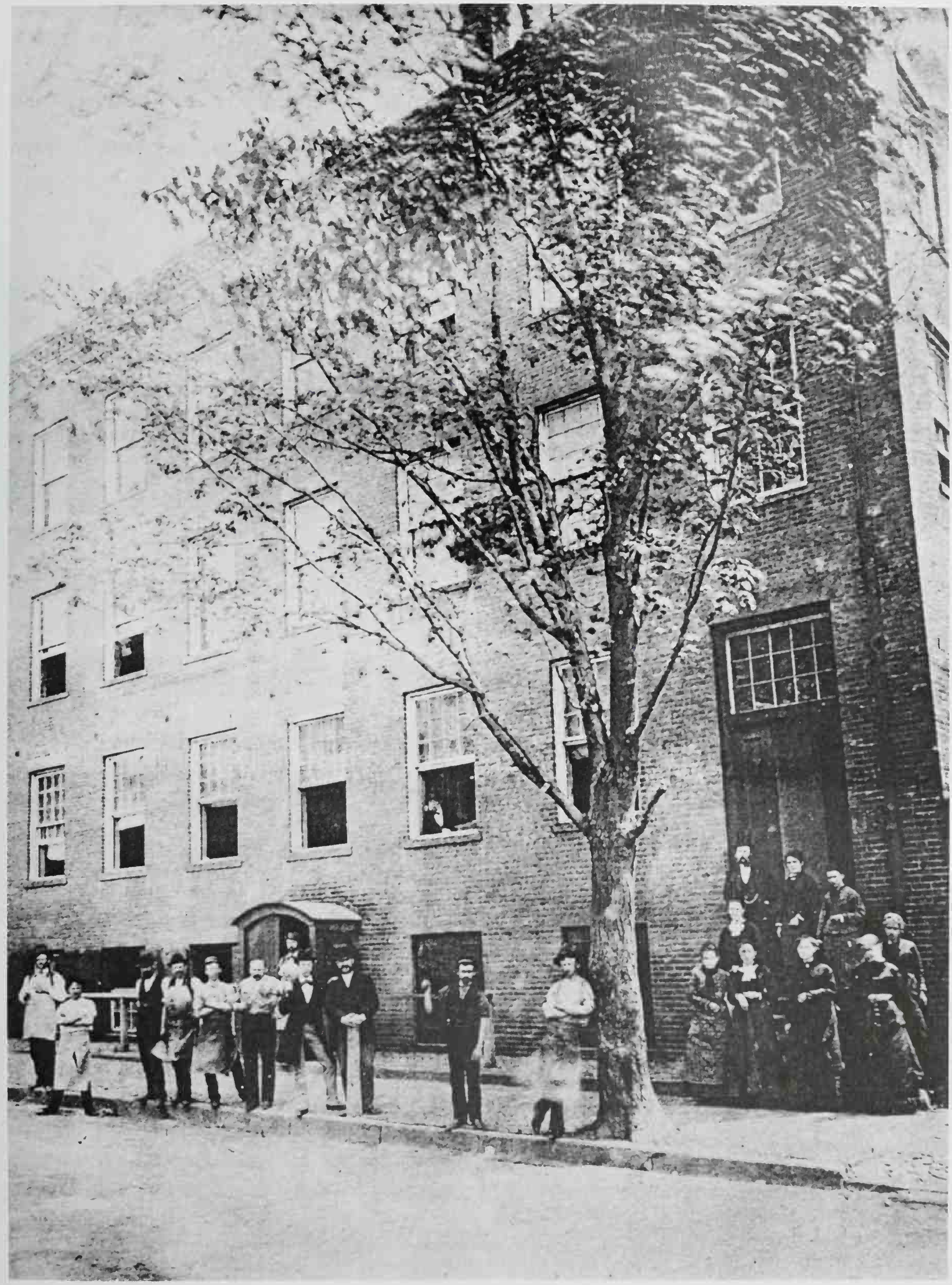


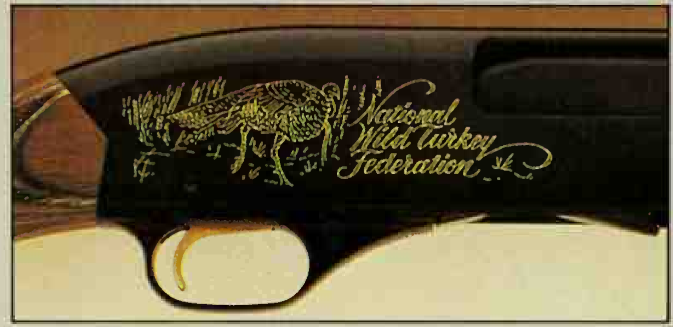
Model 24 Shotgun

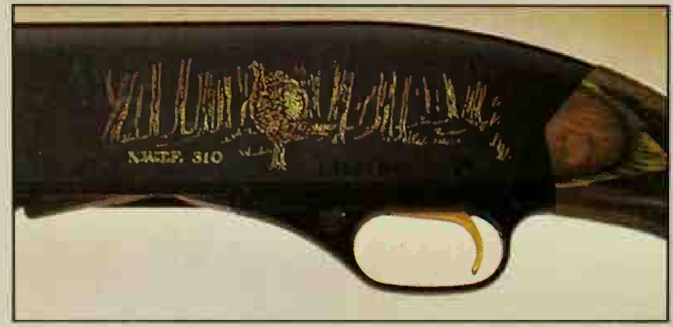
Winchester Model 24 Hammerless Double Barrel Shotgun. The Model 24 is a double barreled box lock shotgun with double triggers, plain extractors and automatic safety. Made in 12, 16 and 20 gauge, it was manufactured from 1939 to 1957.

Model 40 Shotgun

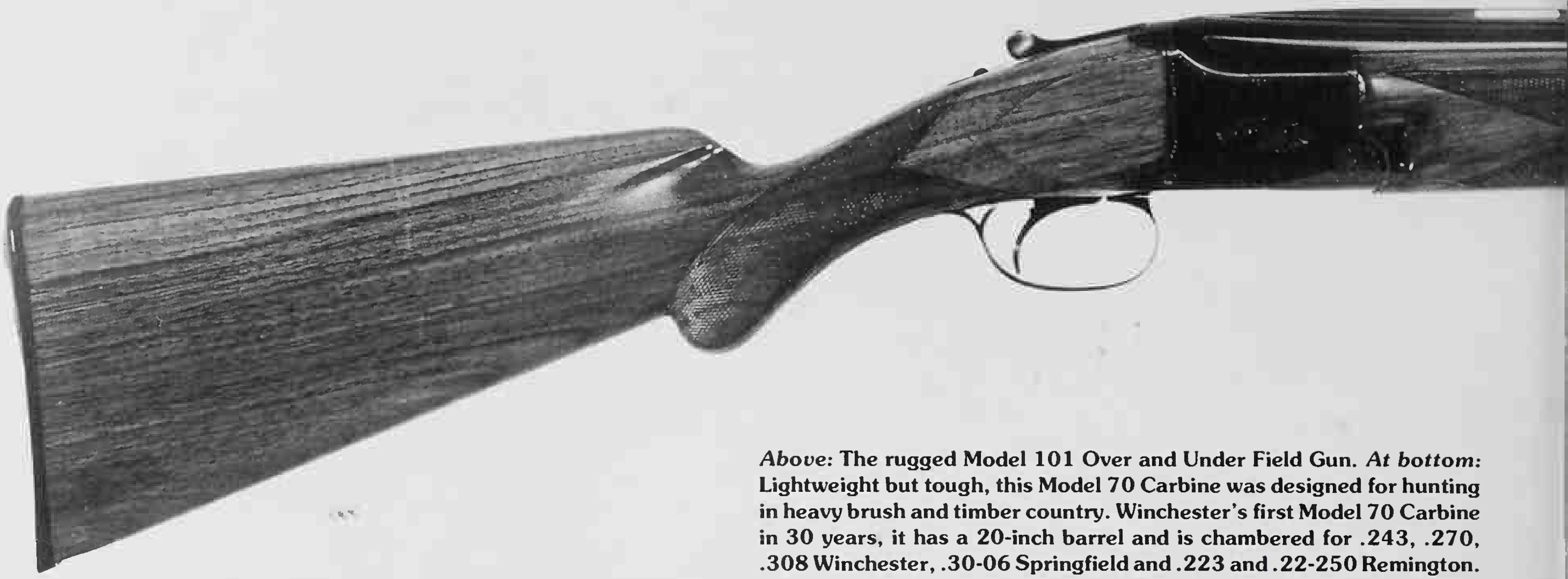
Winchester Model 40 Standard Autoloading Shotgun. Made from 1940 to 1941, the Model 40 is an automatic repeating shotgun with a streamlined receiver. Hammerless and takedown-capable, it is available in 12 gauge only, with a four shell tubular magazine.



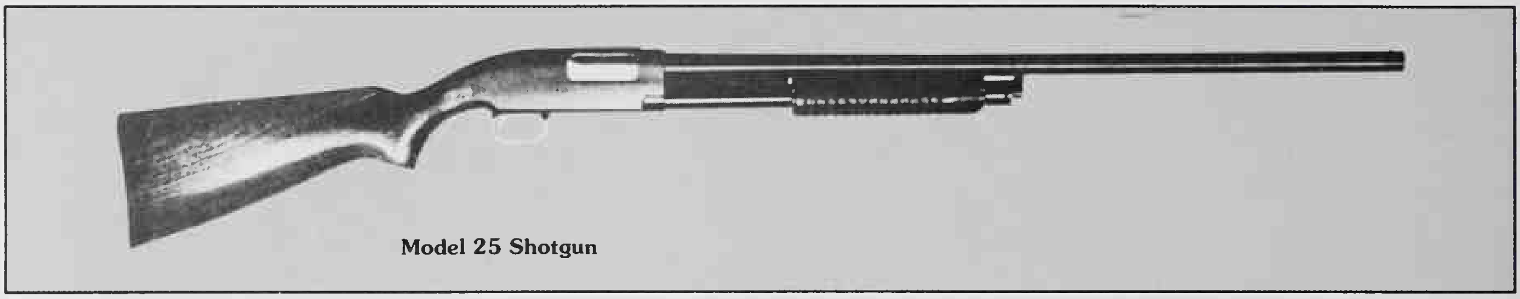




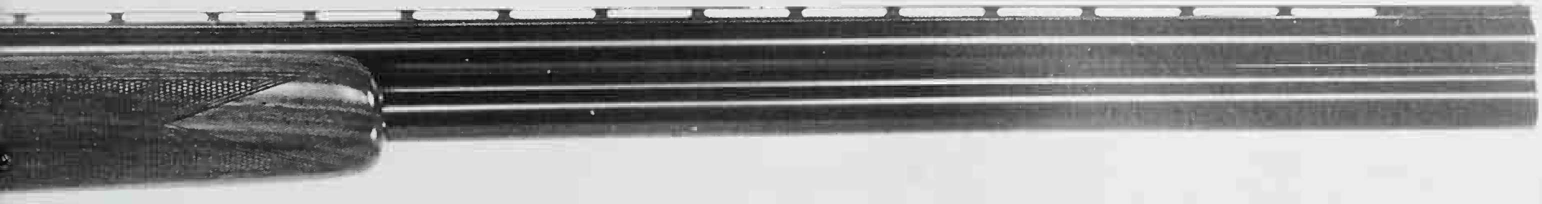
Named the 1987 Gun of the Year by the National Wild Turkey Federation, the Model 1300 Special Turkey Gun *(above)* was introduced as a tribute to the successful restoration of the wild turkey. This 12 gauge, pump action shotgun has a ventilated 22-inch rib barrel, Winchoke system, and a roll-engraved receiver with turkey scenes. It also features military-style lock-up of bolt and barrel *(far right)*. The Collector's Edition Model features an engraved and gold-filled receiver *(left)* and gold-plated trigger, middle and front sights. *Below:* The regular edition Model 1300 Turkey Gun has a satin-finished walnut or laminated WIN-CAM stock and forearm, with roll engraving on the receiver. *Below right:* The Model 1300 CamoPack combines all the features of the regular Turkey Gun with an extra 30-inch Waterfowl barrel.



Above: The rugged Model 101 Over and Under Field Gun. *At bottom:* Lightweight but tough, this Model 70 Carbine was designed for hunting in heavy brush and timber country. Winchester's first Model 70 Carbine in 30 years, it has a 20-inch barrel and is chambered for .243, .270, .308 Winchester, .30-06 Springfield and .223 and .22-250 Remington.



Model 25 Shotgun



Winchester Model 25 Slide Action Repeating Shotgun. Manufactured from 1949 to 1955, the Model 25 is a hammerless, solid frame 12 gauge shotgun.

Winchester Model 50 Standard Grade Autoloader. Designed with a nonrecoiling barrel and independent chamber, the Model 50 is chambered for 12 or 20 gauge. Production for this model ran from 1954 to 1961.

Winchester Model 59 Autoloading Shotgun. The Model 59 has an alloy receiver and a 'Win Lite' steel and fiberglass barrel. Made from 1959 to 1965, this 12 gauge shotgun has a magazine that holds two shells.

Winchester Model 101 Over and Under Field Gun. The Model 101 is a box lock shotgun with an engraved receiver, automatic ejectors, single selective trigger and combination barrel selector and safety. This gun is chambered for 12 or 28 gauge and has been in production since 1963.

Winchester 'Xpert' Model 96 Over and Under Field Gun. The Model 96 has a box lock action similar to the Model 101. It has a plain receiver, automatic ejectors and a selective single trigger. Made in 12 and 20 gauge, it has been manufactured since 1976.

Winchester Model 1200 Slide Action Field Gun. The Model 1200 is a rotary bolt, takedown style shotgun in 12, 16 and 20 gauge with a four shot magazine. It has been manufactured from 1964 to date.

Winchester Model 1400 Automatic Field Gun. The Model 1400 is a gas operated, front-locking rotary bolt takedown style shotgun in 12, 16 or 20 gauge, with a two shot magazine. It was manufactured from 1964 to 1968.

Winchester Super X Model 1 Automatic Field Gun. Produced since 1974, this 12 gauge takedown shotgun is gas operated.

US Repeating Arms Rifles

The following rifles are produced under license from Olin Corporation.

Winchester Model 70 Bolt Action Center Fire Rifle. This bolt action, center fire rifle is avaialable with barrel lengths of 20 to 24 inches, weighs 5.75 to 8.5 pounds and has a magazine capacity of three to five rounds, depending on ammunition. It is available in a wide range of calibers, from .223 Remington to .458 Winchester Magnum.

As a result of having been in continuous production for close to 50 years, the Model 70 has partaken of many refinements and technological advancements. The Model 70 XTR Sporter Rifle series comes in various calibers. The Standard model has a Monte Carlo stock and cheekpiece, a hinged steel floorplate, jeweled bolt, detachable sling swivels, rifle sights, and a 24-inch barrel. The Magnum version has the same sporter features and 24-inch barrel. Available calibers are 7mm Remington Magnum and .264, .300 and .338 Winchester Magnum.

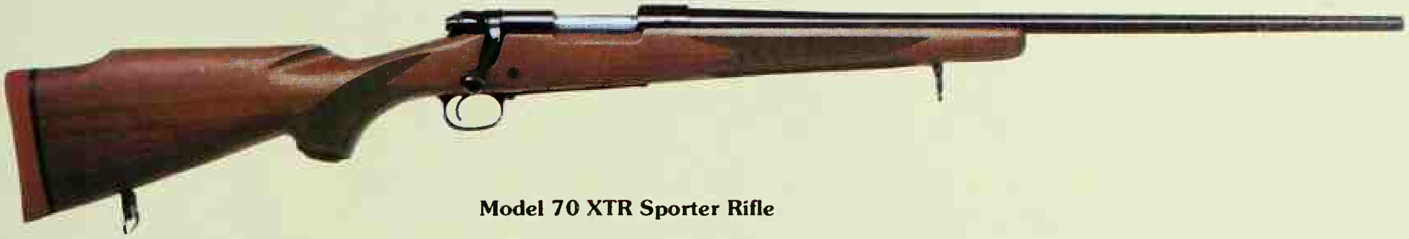
The Special Varmint model has a 24-inch, high strength Winchester steel barrel without sights. The Model XTR Super Express Rifle comes in two big game calibers—.375 H&H Magnum or .458 Winchester Magnum—and its sporter stock is reinforced with two steel crossbolts. In addition, this fine big game rifle comes equipped with a forward sling swivel and adjustable open rear and ramp front sights.

The Model 70 XTR is also available in a Featherweight version, which has a 22-inch barrel, weighs 6.75 pounds and has a receiver drilled and tapped for scope mounting. A special European version of the Featherweight combines the same features with 6.5 X 55 Swedish Mauser caliber chambering. A limited edition .270 Winchester Ultra Grade Featherweight with 24 karat gold hand engraving and custom hand fitting is also available, serial numbered 1 to 1000.

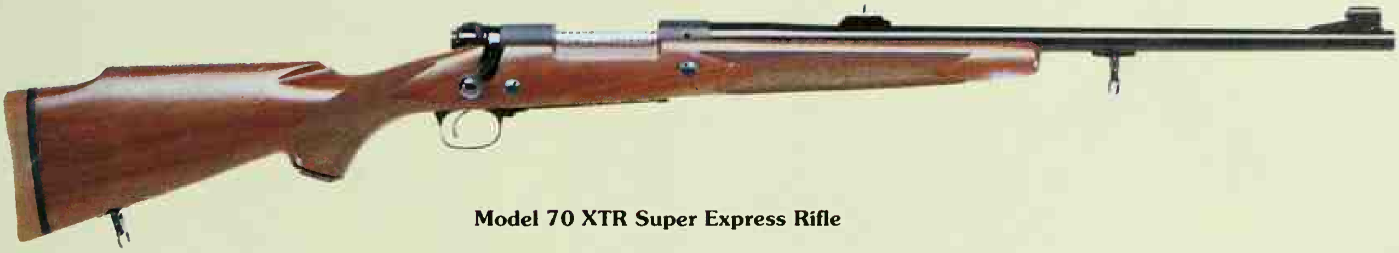
The Model 70 Lightweight Carbine is a light and fast handling utility and brush gun, weighing six pounds with a 20-inch barrel. The Ranger Bolt Action Rifle has a ramp bead front, adjustable rear sights and a one piece American hardwood stock. The Ranger Youth Bolt Action Carbine is size-scaled to fit younger or smaller shooters, weighs 5.75 pounds, has ramp bead front and semibuckhorn folding leaf rear sights and is complete with an American hardwood stock.

The Model 70 Winlite offers the Model 70 bolt action with a fiberglass stock for light weight, strength, accuracy and the ultimate stability for bedding of the barreled action. It is available in four calibers and in barrel lengths of 22 and 24 inches, and its stock has a contoured rubber recoil pad and sling swivel studs.

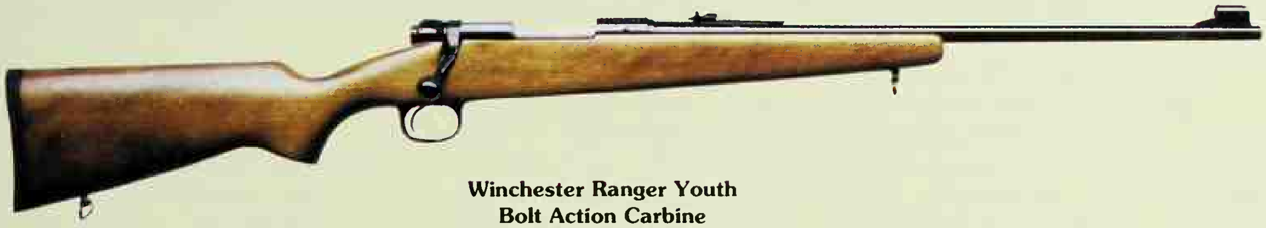
Above: **Designed for the smaller shooter—the Ranger Bolt Action Carbine.** ***Below:*** **Like the Model 70 Carbine on the previous page, the Model 70 XTR Featherweight Rifle is made for easy carrying in mountain terrain.**



Model 70 XTR Sporter Rifle



Model 70 XTR Super Express Rifle



Winchester Ranger Youth
Bolt Action Carbine

THE WINCHESTER® MODEL 70 XTR® SPORTER SERIES.
HERE'S WHY NOTHING ELSE MEASURES UP.
WINCHESTER.
Made in the USA
by American craftsmen since 1866.
Winchester trademarks licensed from Olin Corporation
Versatile, foolproof
3-position safety

Winchester Model 94 Carbines. As a hunting rifle, the Model 94 has achieved legendary status—it is regarded by many as the symbol of the Wild West. The Model 94 is a lever action, center fire rifle with a magazine capacity of five to nine rounds, barrel lengths of 16 to 24 inches and weights of six to seven pounds, depending on the variant.

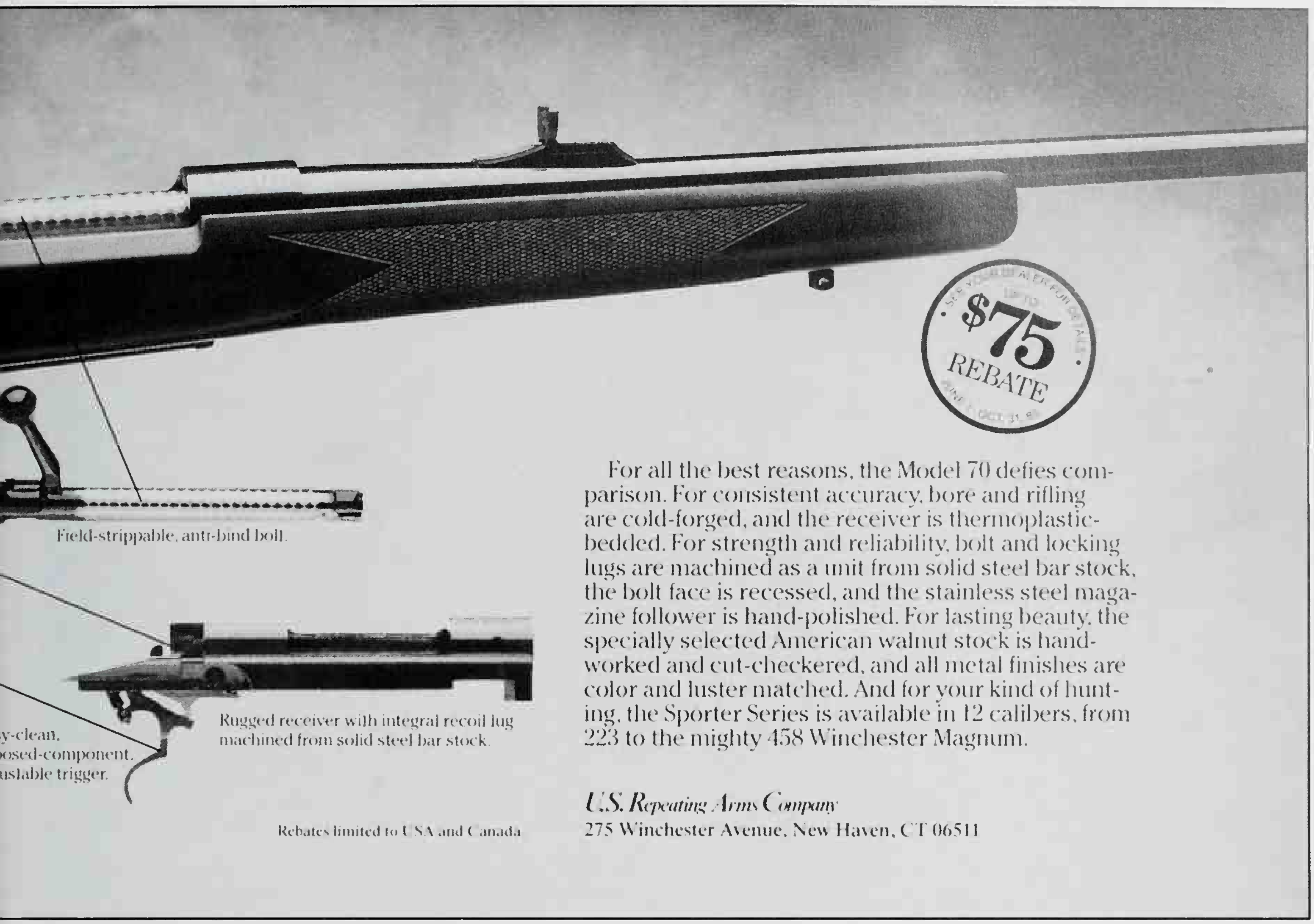
It is made with a forged steel receiver, designed for side ejection of spent cartridges and top mounting of scopes. Each carbine comes packaged with a thumb hammer extension that is reversible for right- or left-handed use with a scope.

The .30-30 caliber Model 94 XTR Carbine has a 20-inch barrel, dovetailed blade front, and semibuckhorn rear sights. It also has a six round capacity magazine, precise cut checkering and a butt plate. The XTR in 7-30 Waters, developed for higher muzzle velocity and flatter shooting accuracy, features a 24 inch barrel with a dovetailed blade front sight and seven cartridge capacity.

The Model 94 Standard Carbine is available in .30-30 Winchester with a six-shot magazine, 20-inch steel barrel, composition butt plate and dovetailed blade front, and adjustable rear, sights. The compact Trapper Carbine combines a 16-inch barrel with post front sight, and either a five shot magazine in .30-30 Winchester, or .45 Colt and .44 Remington Magnum calibers with nine-shot magazine capacity.

Winchester Range Lever Action Carbine

Model 94 XTR Rifle



Field-strippable, anti-bind bolt.
y-clean,
osed-component,
ustable trigger.
Rugged receiver with integral recoil lug machined from solid steel bar stock.
$75
REBATE

For all the best reasons, the Model 70 defies comparison. For consistent accuracy, bore and rifling are cold-forged, and the receiver is thermoplastic-bedded. For strength and reliability, bolt and locking lugs are machined as a unit from solid steel bar stock, the bolt face is recessed, and the stainless steel magazine follower is hand-polished. For lasting beauty, the specially selected American walnut stock is hand-worked and cut-checkered, and all metal finishes are color and luster matched. And for your kind of hunting, the Sporter Series is available in 12 calibers, from 223 to the mighty 458 Winchester Magnum.

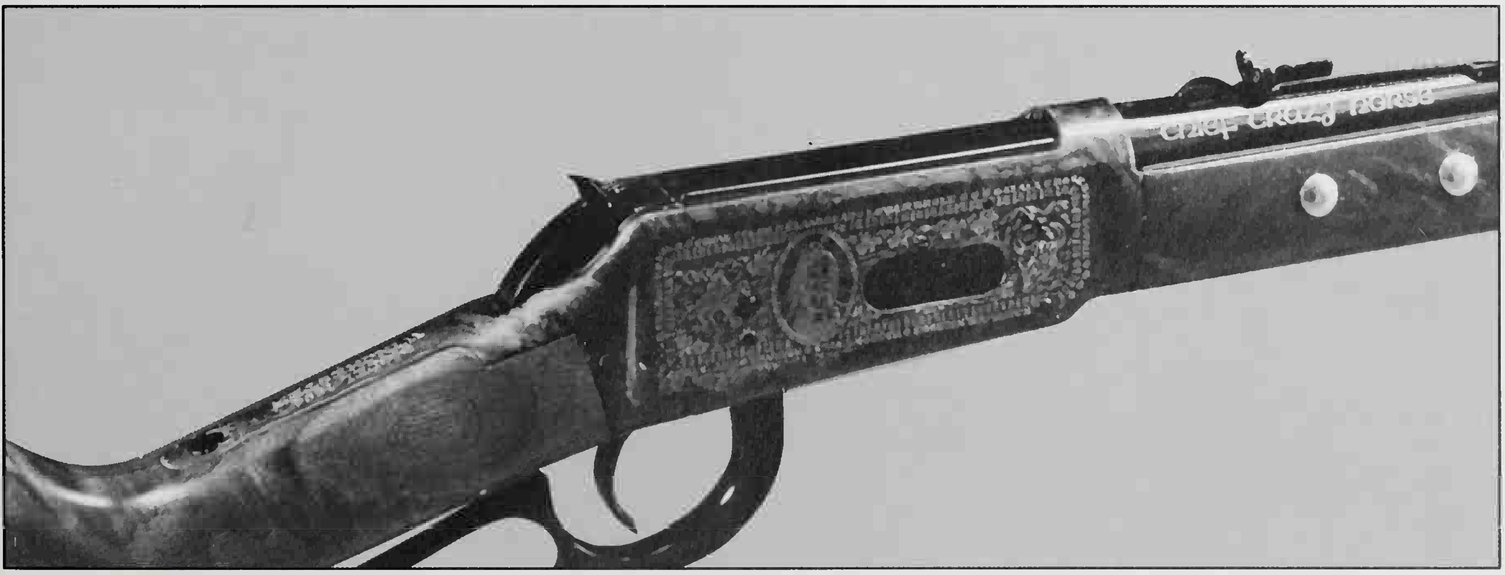
Rebates limited to USA and Canada

U.S. Repeating Arms Company
275 Winchester Avenue, New Haven, CT 06511

Above: **The Model 70 XTR Sporter combines accuracy with the beauty of an American walnut stock.** ***Below:*** **The Model 94 Chief Crazy Horse Commemorative, complete with tribal decorations, honors the Sioux people.**

The Range Lever Action Carbine is a five shot .30-30 caliber with an American hardwood stock, a 20-inch barrel and blade front and semibuckhorn rear sights. For big game hunting the Model 94 Big Bore utilizes .375, .356 or .307 Winchester cartridges. This gun also features side ejection, Monte Carlo stocks of American walnut, sling swivels and a reversible thumb hammer extension. The receiver is forged steel with reinforced side panels, and has been drilled and tapped for top mounting of scopes.

To celebrate Winchester's 120th Anniversary, the company issued limited edition Model 94 carbines commemorating founder Oliver F Winchester, the horse-and-rider trademark, and Chief Crazy Horse. The Chief Crazy Horse Model 94 Winchester celebrates the great Sioux chief and his people, and is beautifully and symbolically engraved. This fine firearm is chambered for the classic .38-55 Winchester cartridge.



Winchester Model 9422 Rifles. This lever action, rimfire .22 caliber rifle has available barrel lengths of 20.5 inches and 22.2 inches, and weighs from 6.25 pounds to 6.5 pounds. The Model 9422 XTR, considered one of the world's finest production sporting arms, features positive lever action and bolt design for feeding and chambering from any shooting position.

The receiver, frame and finger lever are forged steel; receivers are designed for side ejection of spent cartridges and are grooved for top mounting of scopes. Each rifle has an adjustable thumb hammer extension with half-cock safety, ramped bead front and semibuckhorn rear sights.

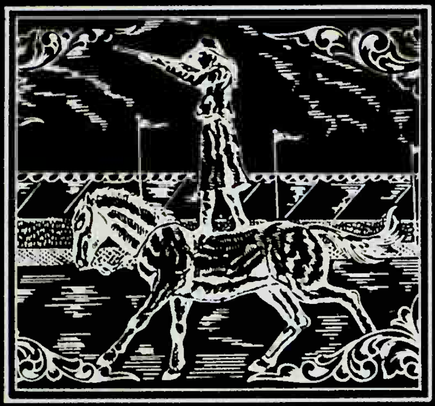
The Standard Model 9422 XTR Rifle has a western saddle carbine profile with a straight stock and forearm with barrel band, traditional finger lever and composition butt plate. Model 9422 XTR Classic Rifle features include a satin finish walnut stock with fluted comb and crescent steel butt plate, curved finger lever and undercut pistol grip, and an extended forearm with barrel band and 22.5 inch barrel for long range accuracy.

The Commemorative Models are all limited edition firearms that feature the handsome Winchester engraving, which is designed around historical images and tastefully calligraphed lettering. The Model 9422 Boy Scouts of America Commemorative, complete with commemorative .22 Long ammunition, may well claim to be the the first such honor for that organization. A maximum 15,000 units were manufactured in the mid-1980s.

The .22 caliber, lever action, Annie Oakley Commemorative Model 9422 is the first US firearm to honor a historic American woman. Only 6000 units of the Annie Oakley Rifle were issued.

Above: **The Wells Fargo Commemorative Carbine honors the 125th anniversary of Wells Fargo. *Below left:* The Bull Buffalo Skull with Blue Tails Gun Mount. *Right:* The Model 9422 Annie Oakley Commemorative—a tribute to sharpshooter Annie Oakley *(below)*, heroine of the Old West.**

— COPYRIGHT 189
— RICHARD K F



WINCHESTER MODEL 9422 ANNIE OAKLEY™ COMMEMORATIVE

The First Commemorative Winchester® Rimfire Rifle to Honor an American Heroine.

The Annie Oakley Commemorative Model 9422 is a highly decorative 22-caliber rifle . . . a tribute to the sharpshooting woman who has become a central figure in American folklore.

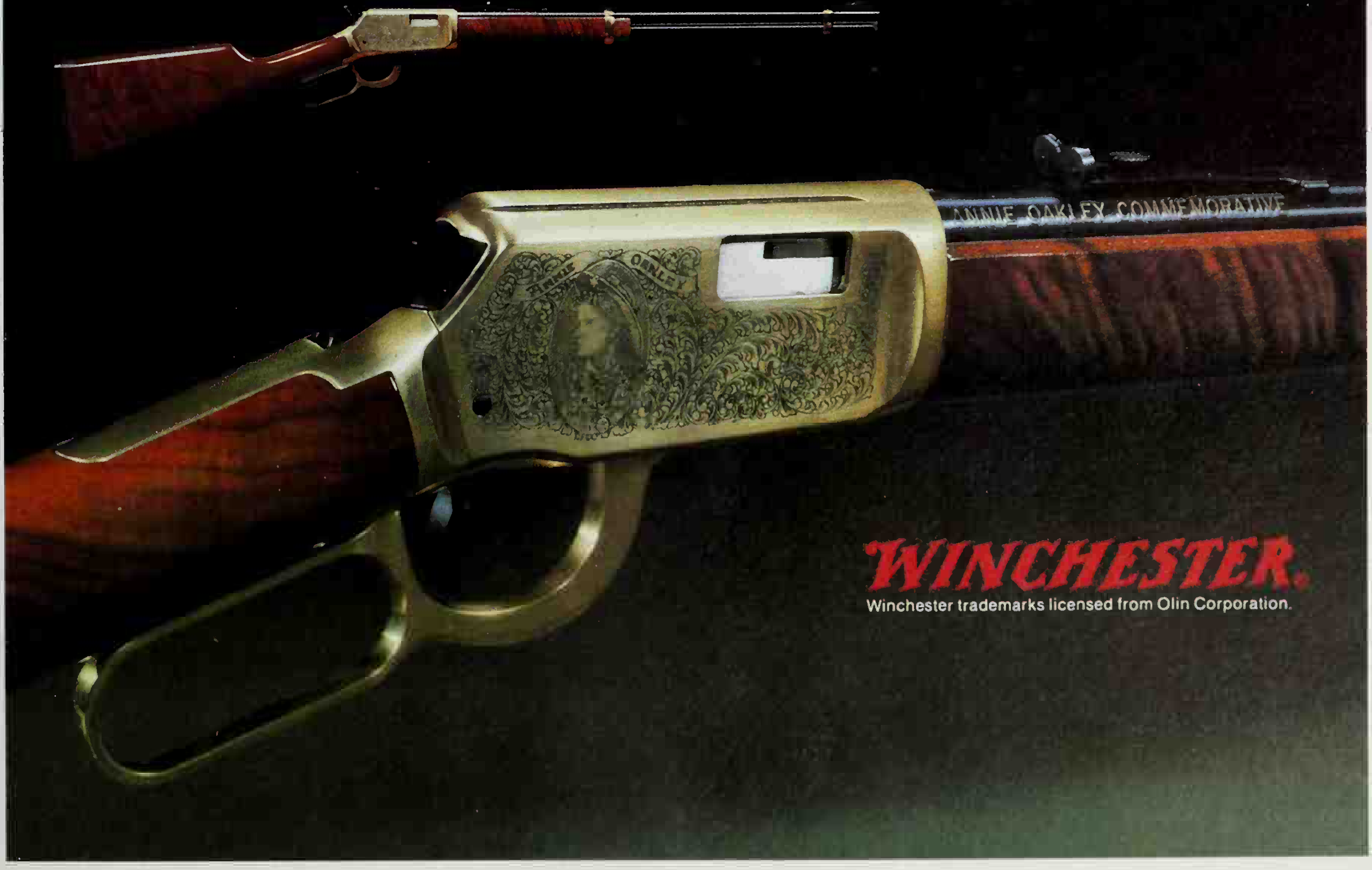
Annie Oakley gained immense fame in Buffalo Bill's Wild West Show from 1885 to 1902. She created a sensation in America and Europe because of her uncanny accuracy with a rifle. Her highly-publicized use of Winchester firearms was an important factor in establishing the reputation of Winchester guns throughout the world.

It is fitting that this ultimate shooter be honored with the Model 9422, considered one of the world's finest production sporting arms. Its classic styling, accuracy, and feel are the results of superb craftsmanship. Finger lever, receiver, and barrel bands are antique gold-plated. The receiver is roll-engraved with her portrait and a scene from her show. The barrel is inscribed in gold "Annie Oakley Commemorative." The stock and forearm are select American walnut with a protective high-luster finish.

Functional features include a brass internal magazine tube, half-cock safety, hooded bead front sight and semi-buckhorn rear sight. Internal components are carefully finished for smoothness of action. Positive lever action and bolt design ensure feeding and chambering from any shooting position. Take-down for inspection or cleaning is greatly simplified with a single-screw construction.

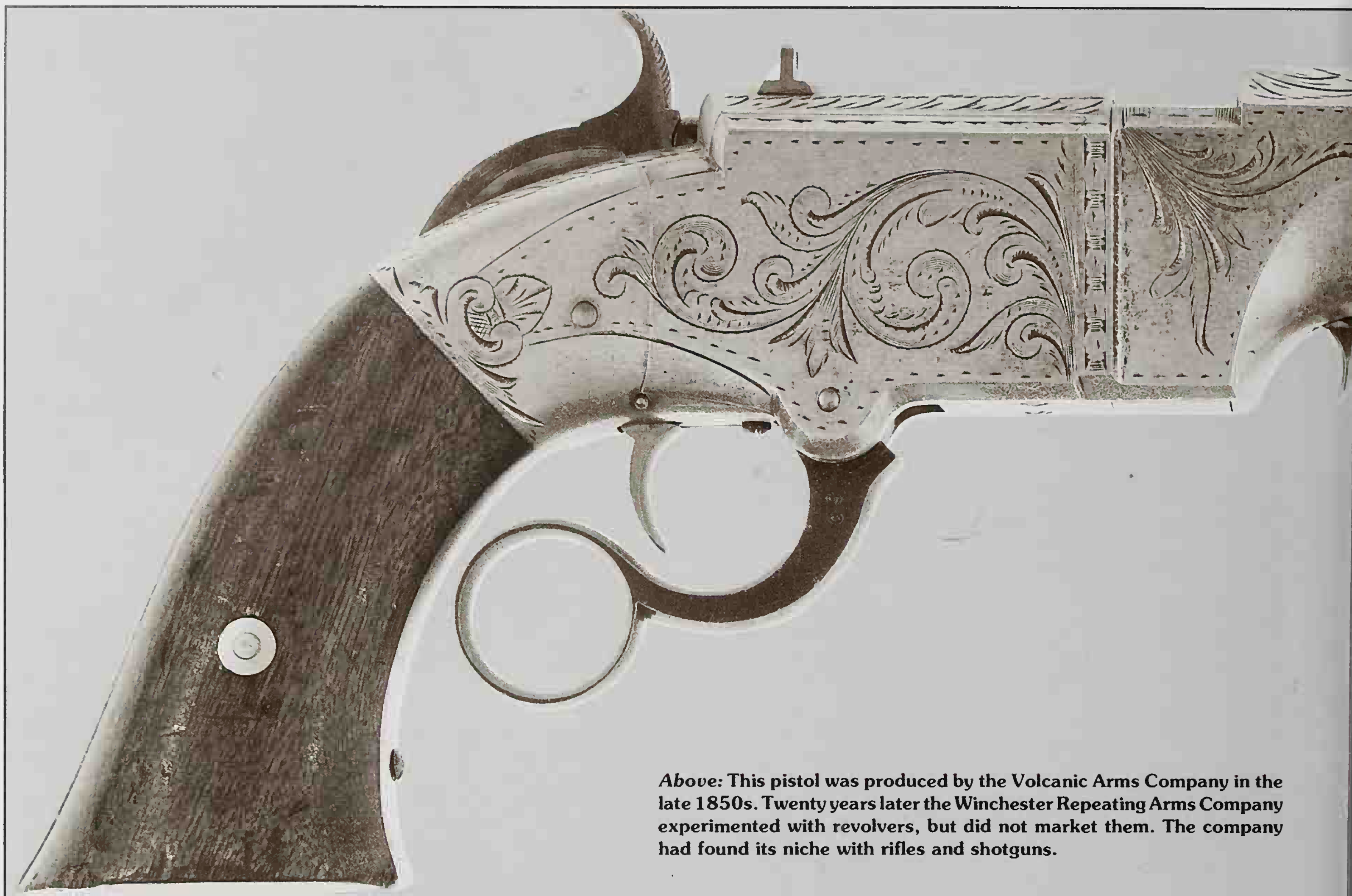
In keeping with established traditions for Winchester commemorative rifles, the Annie Oakley 9422 is offered in a limited issue. Six thousand of these special rifles will be produced, bearing serial numbers AOK1 through AOK6000.

The Annie Oakley Commemorative Model 9422 is a decorative, distinctive tribute to a remarkable woman. It will be a treasured possession for collectors, sportsmen, and sportswomen.



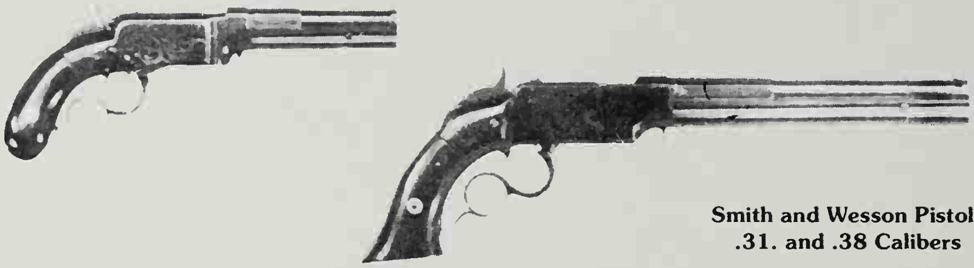
WINCHESTER.

Winchester trademarks licensed from Olin Corporation.

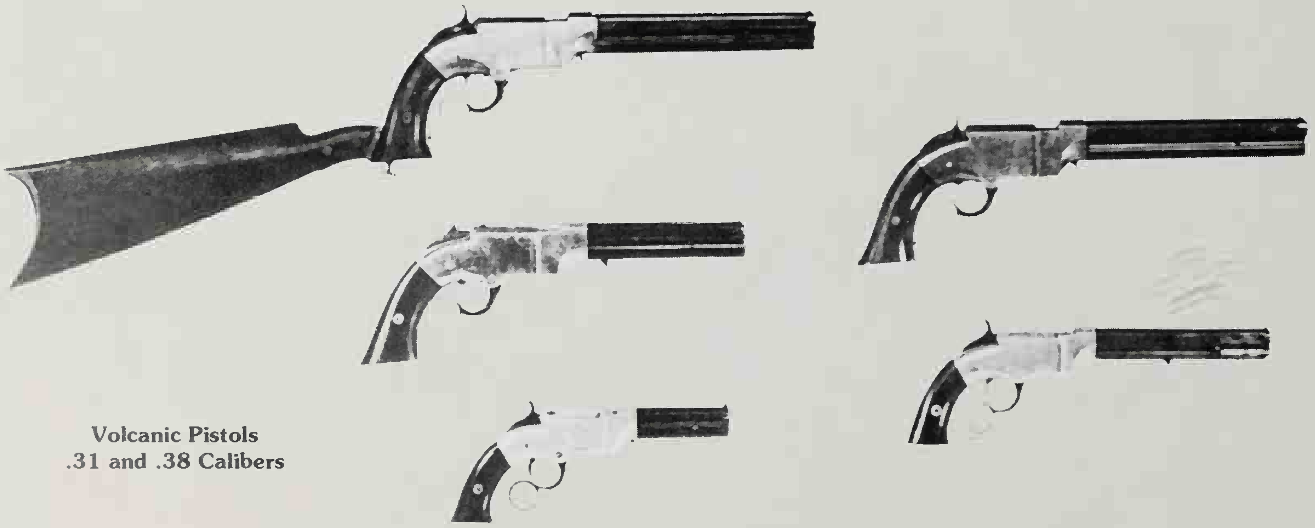


Above: This pistol was produced by the Volcanic Arms Company in the late 1850s. Twenty years later the Winchester Repeating Arms Company experimented with revolvers, but did not market them. The company had found its niche with rifles and shotguns.

Forerunners of the True Winchester



Smith and Wesson Pistols
.31. and .38 Calibers



Volcanic Pistols
.31 and .38 Calibers

Winchester Pistols

In a letter to Ed Martin dated 17 October 1862, Oliver F Winchester mentioned that 3000 revolvers were being produced by the New Haven Arms Company. Technically, these are the first Winchester pistols. They held six shots and retailed for about $15. Historians believe that John Walch, John Parker Lindsay and Cyrus Manville were all involved in the contracting and patenting of these first Winchester pistols.

These 'Walch Revolvers,' as they came to be known, were of two major types: the brass frame model and the iron frame model. The early Winchester Company produced these revolvers from 1860 until 1862. At the Centennial Celebration in Philadelphia in 1876, Winchester displayed models and drawings of a number of proposed pistols that were all built to the same design in three basic model classifications, all featuring solid frame construction.

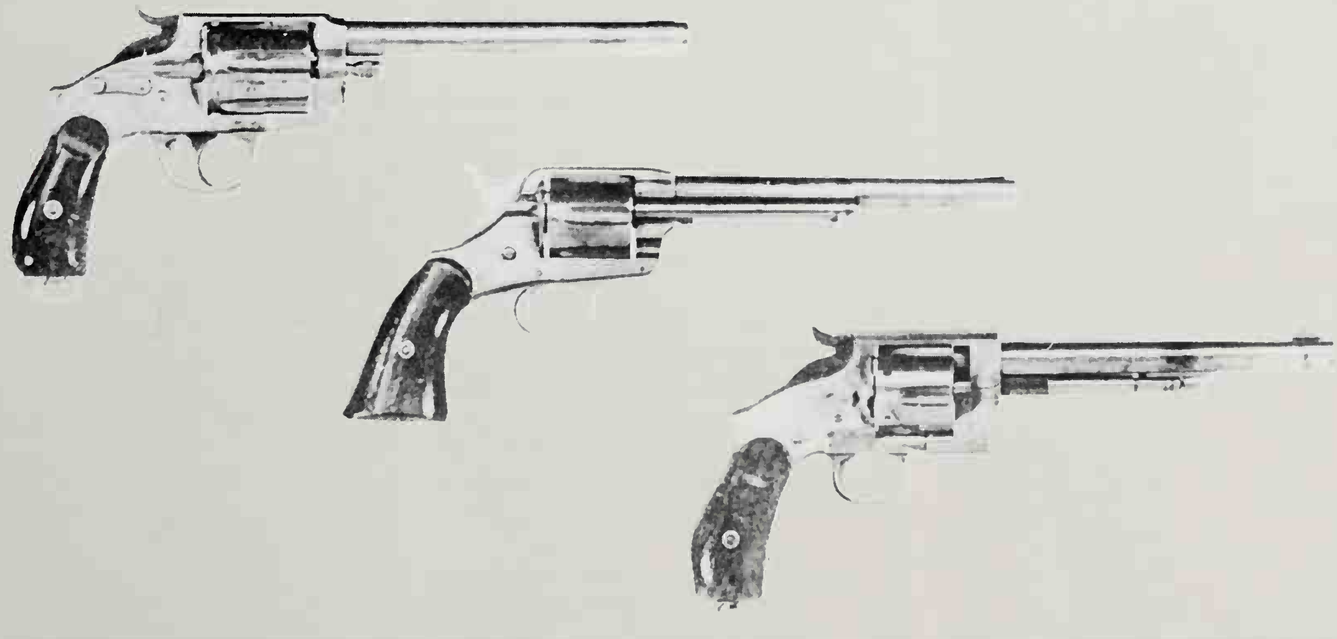
Apparently Winchester's work on pistols was in the direction of developing a design that would have the solid frame of the unsuccessful Colt revolver and the rapid ejection capability of the Smith and Wesson pistols. All of the Winchester revolvers, of which there were very few, closely followed either their Colt or Smith and Wesson counterparts in exterior appearances. None of these revolvers played an important part in Winchester history, as they were all unsuccessful and were not produced commercially—except for extremely small quantities, usually for government contracts.

For example, Winchester had contracts with the US government for the US Ordnance Trials, and with Imperial Russia. Around the turn of the century, Winchester did produce a .22 Single Shot Bolt Action pistol in limited numbers, but it was never successfully marketed.

The War Department contracted with Winchester to manufacture the Colt Model 1911 .45 Automatic Pistol, but due to war contracts and other business at the time, Winchester subcontracted manufacture of these pistols to other firms. When the Armistice was signed in November of 1918, production ceased after only a few hundred of these automatics were made.

It is interesting to note that, as late as the 1960s, Winchester produced some experimental revolvers that were never marketed. Winchester had made its mark in history with repeating rifles, and wisely never ventured very far into the realm of pistols, which was already dominated by other patents and design innovations.

Winchester Experimental Pistols



GLOSSARY OF TERMS

Action. Generally defined as the moving parts of a firearm. Three basic 'actions' are prevalent in the world of small firearms. These are: single action, double action and automatic (semi and full).

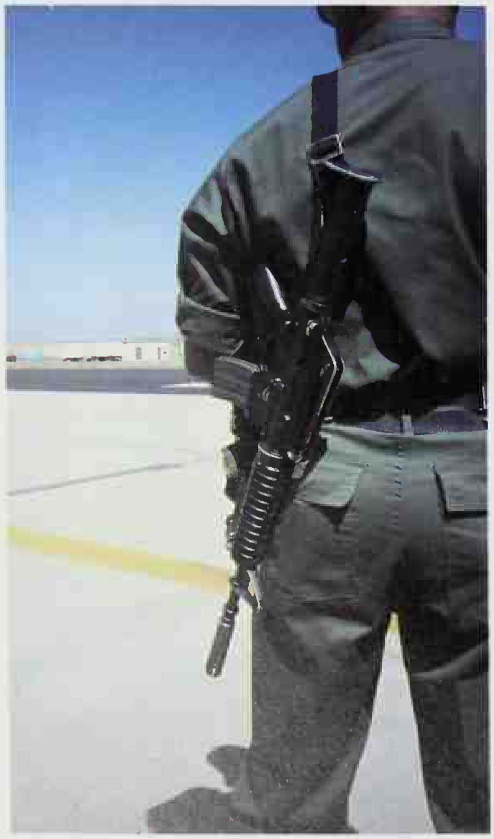
Anvil. The actual piece of metal in the primer of a centerfire metallic cartridge which comes into direct contact with the priming compound at the blow of the hammer.

Ball. *(see Bullet)*

Barrel. The tube through which the bullet is propelled by the powder explosion. The 'bore' of a barrel is its inside diameter. The 'muzzle' of a barrel is the end furthest from the user. The 'breech' of a barrel is the end nearest the user.

Barrel Key. Sometimes called the 'barrel bolt.' A key which holds the barrel to the center pin of the frame.

Barrel Lug. A block of metal forming the frame of percussion-cap Colt revolvers which was threaded to hold the jointed-lever ramrod in place.



SIX CARTRIDGES
FOR
COLT'S NAVY PISTOL
A Superior Quality of Powder is used, made by A. G. Fay, Potter & Tolman, Boston, Mass.
ROBERT CHADWICK, Manufacturer,
HARTFORD, CONN.
6 Combustible Envelope
CARTRIDGES,
MADE OF HAZARD'S POWDER
EXPRESSLY FOR
COL. COLT'S PATENT
NEW MODEL
REVOLVING HOLSTER PISTOL
inch Calibre.
ADDRESS COLTS CARTRIDGE WORKS
HARTFORD CONN. U.S.A.
5 Combustible Envelope
CARTRIDGES
MADE OF HAZARD'S POWDER
EXPRESSLY FOR
COL. COLT'S PATENT
NEW MODEL
REVOLVING
POLICE PISTOL.
inch Calibre.
Combustible Envelope
CARTRIDGES
COL. COLT'S PATENT
REVOLVING
POCKET PISTOL

Bore. *(see Barrel)*

Breech. *(see Barrel)*

Bullet. The projectile fired from cartridge firearms. 'Balls' are bullets which are fired from early firearms. 'Shot' is generally thought of as being a collection of bullets or balls fired from the same enclosure.

Butt. Usually the shoulder rest of the wooden stock of a firearm.

Carbine. A shortened rifle.

Cartridge. Technically the housing for the powder or explosive charge, but generally defined as the housing, the charge and projectile together.

Center Fire. A metallic cartridge fired by a primer located in the center of the rear of the shell.

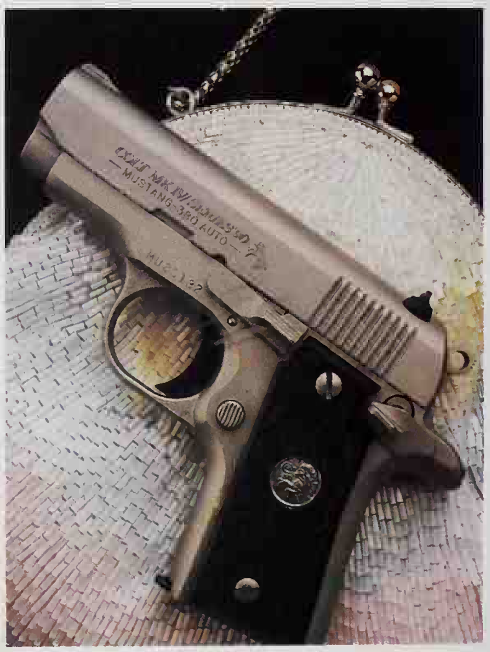
Center Pin. The pin on which the cylinder revolves. At one time referred to as the 'arbor.'

Chamfer. A bevel in the barrel of a percussion cap revolver used to make it easier to load the bullet into the chamber.

Chamber. The bored recessions in the cylinder of a revolver meant to hold the charges.

Cock. An early name for the hammer of a revolver.

Cylinder. The round revolving breech piece bored with chambers which holds the cap, powder and ball or, depending on the modernity of the firearm, the cartridge, of a revolver.


COLT MK IV/SERIES 80
MUSTANG .380 AUTO

Clockwise from immediate left: **A Colt Mustang 380 (a popular law enforcement backup gun); a security guard at Beale Air Force Base, with his Colt M16 dangling from its shoulder sling; combustible envelope cartridges, made for use in Colt's early percussion cap revolving pistols—these particular cartridges were made under a patent taken out in 1862; the open breech of a Browning Special Steel Superposed shotgun.**

Cylinder-locking Bolt. The bolt which locks the cylinder in such a manner that one of the chambers is always in line with the barrel.

Deringer. A small single-shot pistol made by Henry Deringer of Philadelphia, Pennsylvania. It has come to define all very small pistols usually used for personal protection.

Double Action. A revolver action in which the pulling of the trigger both cocks the hammer and turns the cylinder as well as fires the cartridge.

Ejector. The device for removing the cartridge case from the firearm after it has been fired.

Firing Pin. A small pin in the frame of a firearm that, when struck by the hammer, comes into direct contact with the cartridge and fires it.

Forestock. That part of the wood stock of certain firearms which lies in front of the trigger.

Fulminate Of Mercury. A chemical compound of mercury which explodes when struck by a sharp blow.

Grip or Grips. The usually wood or rubber hold for the hand, by which pistols are held.

Hammer. The hammerlike piece of metal which is released by the action of the trigger and strikes either a firing pin, or directly strikes the primer of the cartridge, thus discharging the load in the firearm's chamber.

Hammer Spring. The spring which provides the energy for the driving force of the hammer. Sometimes called a 'mainspring.'

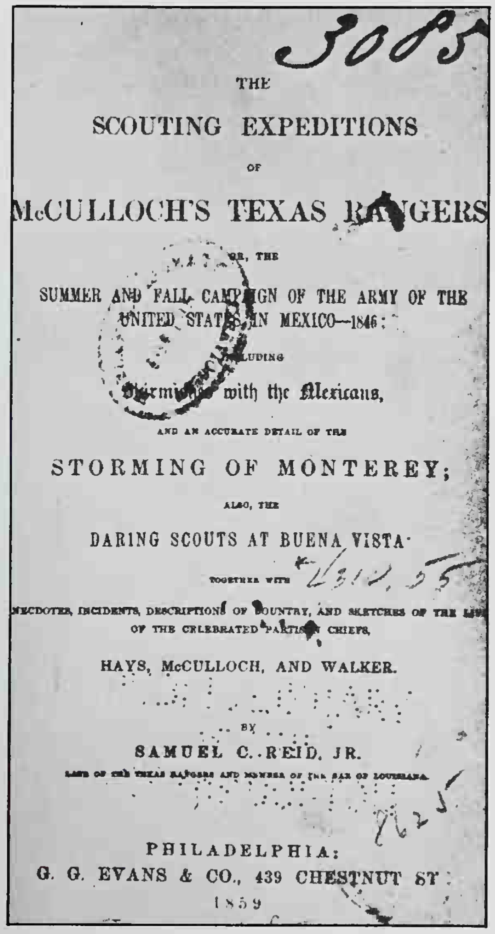
Loading Gate or **Loading Notch.** In certain cartridge revolvers, this was the opening through which cartridges were put in, and removed from, the cylinder.

Lock. In early literature, the 'lock' can be substituted for our modern word, 'action.'

Matchlock. This was the first type of mechanical ignition system used in a firearm.

Maynard's Tape Primers. An invention in the 1850s which was much like children's caps today. A roll of these primers was inserted into the magazine of a percussion cap pistol and were fed into proximity with powder in the cylinder by the act of cocking the hammer prior to discharge.

Musket. The first kind of shoulder arm widely used by infantry soldiers. Muskets first came into prominence in the 16th and 17th centuries. The standard musket of the 18th and early 19th centuries was .69 caliber smoothbore.



3085

THE

SCOUTING EXPEDITIONS

OF

McCULLOCH'S TEXAS RANGERS

OR, THE

SUMMER AND FALL CAMPAIGN OF THE ARMY OF THE UNITED STATES IN MEXICO—1846;

INCLUDING

Skirmishes with the Mexicans,

AND AN ACCURATE DETAIL OF THE

STORMING OF MONTEREY;

ALSO, THE

DARING SCOUTS AT BUENA VISTA

TOGETHER WITH 312, 55

ANECDOTES, INCIDENTS, DESCRIPTIONS OF COUNTRY, AND SKETCHES OF THE LIVES OF THE CELEBRATED PARTISAN CHIEFS,

HAYS, McCULLOCH, AND WALKER.

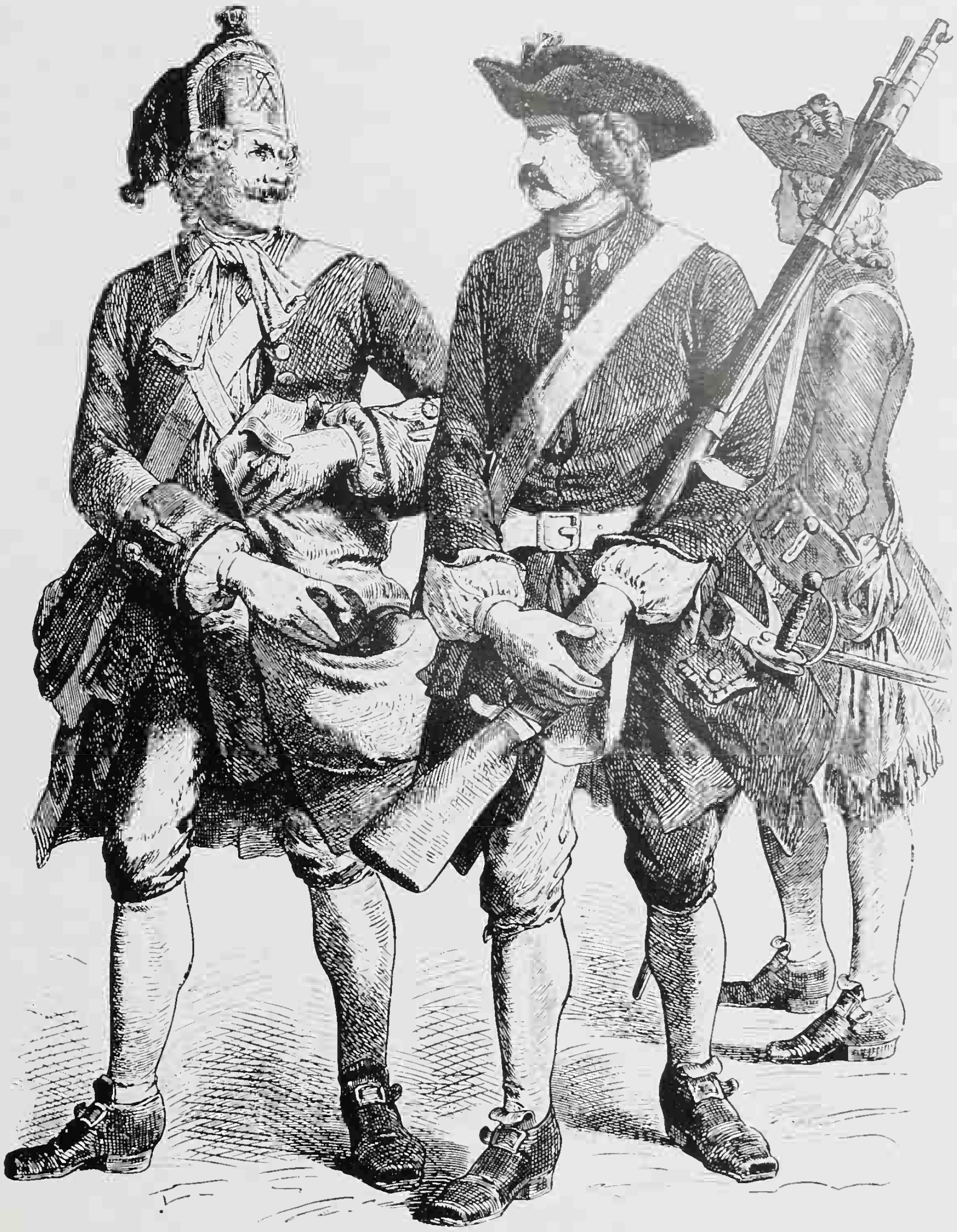
BY

SAMUEL C. REID, JR.

LATE OF THE TEXAS RANGERS AND MEMBER OF THE BAR OF LOUISIANA.

625

PHILADELPHIA:
G. G. EVANS & CO., 439 CHESTNUT ST.
1859



Nipple. A small protrusion on each chamber of a percussion cap arm upon which the percussion cap is placed.

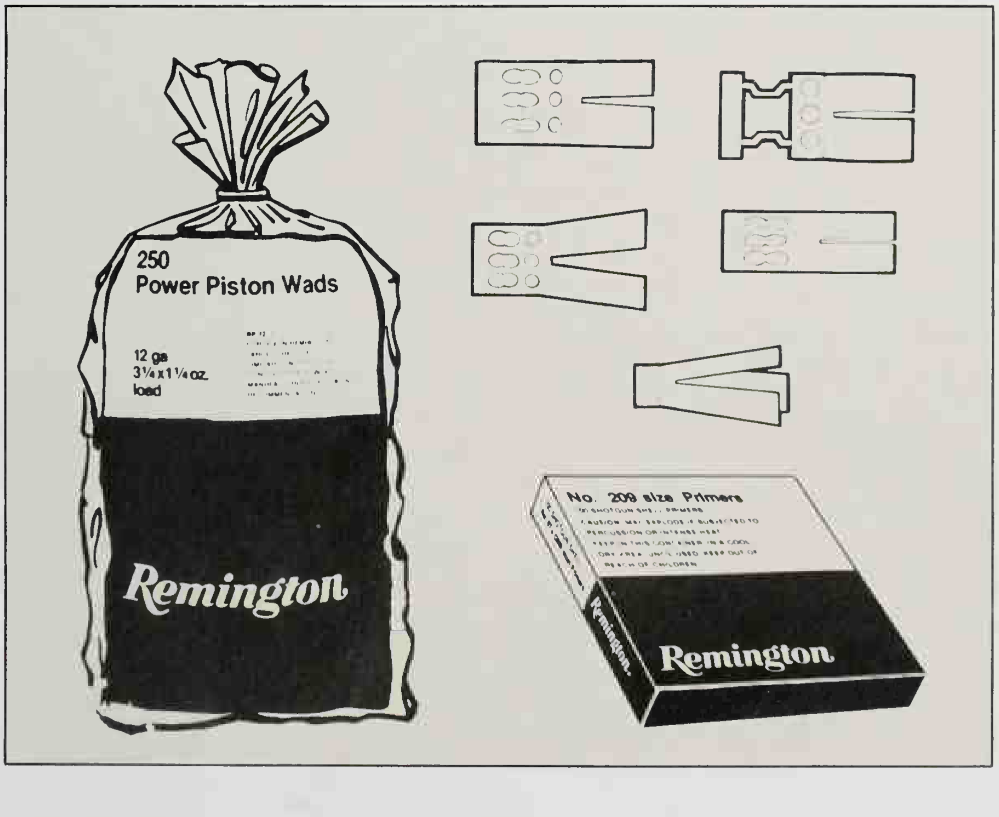
Pepperbox. A particular kind of cap and ball revolver that involved the turning of a single, large cylinder in which each chamber also formed its own individual barrel.

Percussion Cap. A small copper container open at one end containing a small amount of fulminate of mercury. The cap is placed over the nipple of the cylinder of a cap and ball firearm and provides the ignition charge for the powder when struck by the hammer.

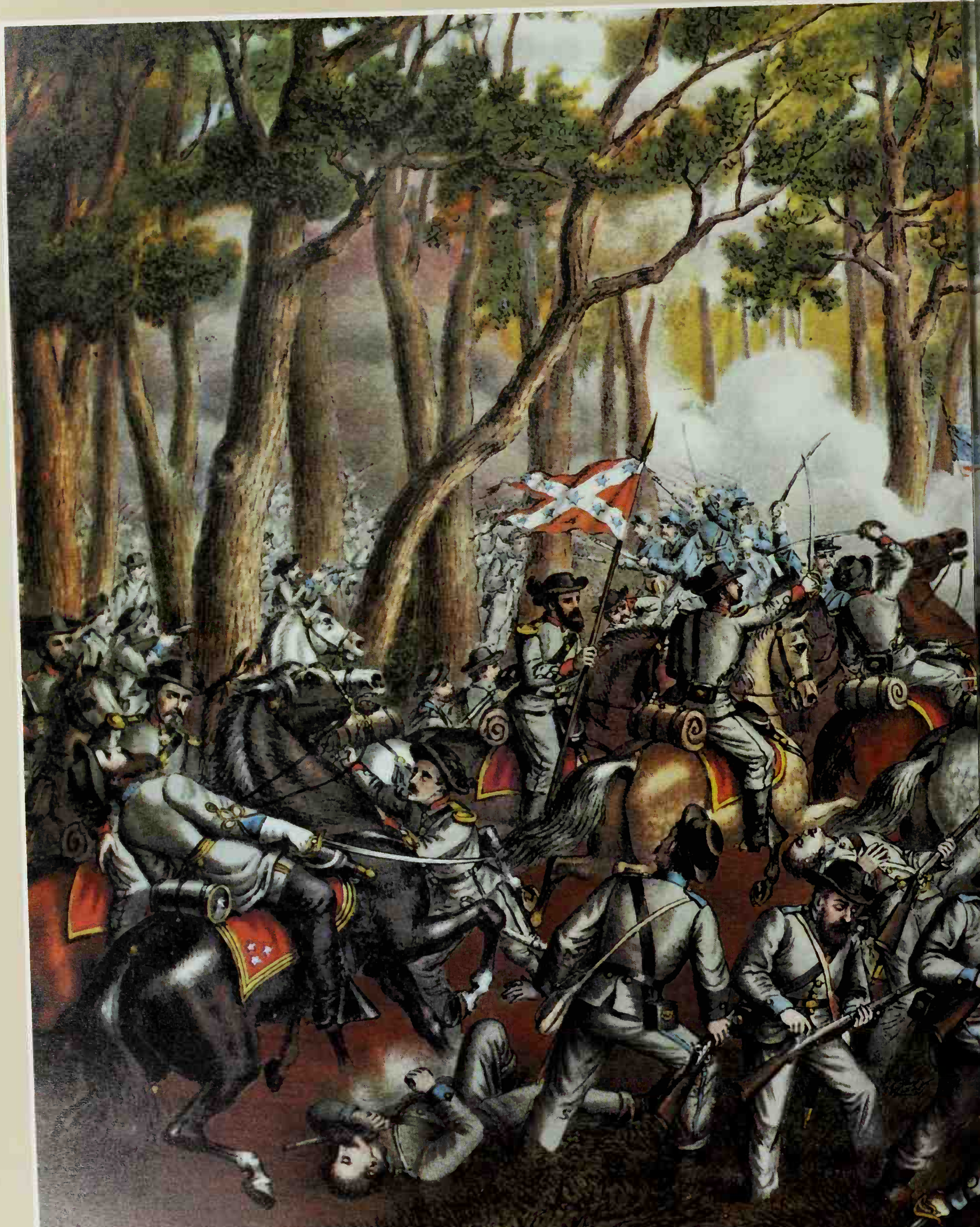
Pistol. A firearm intended for use in one hand only.

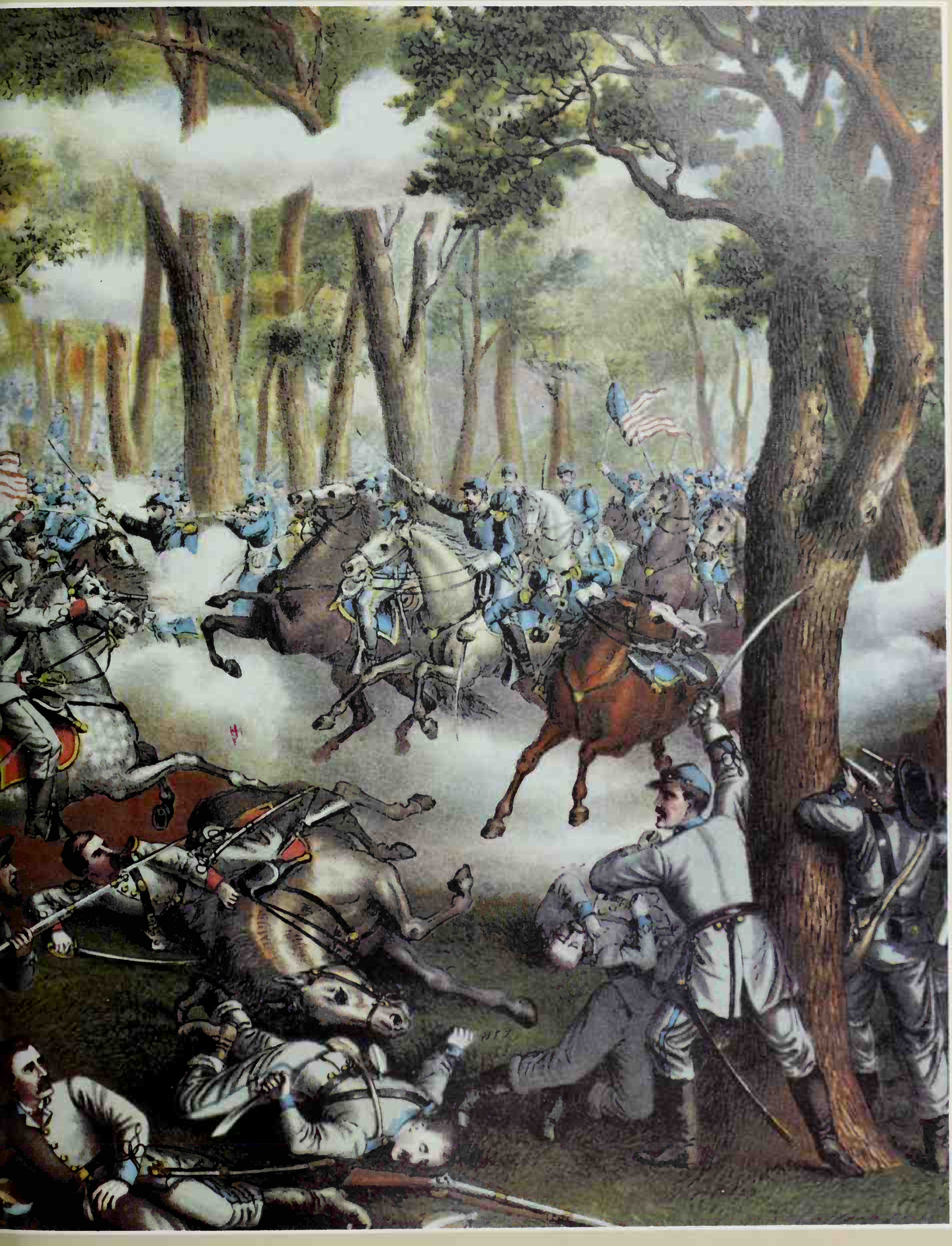
Primer. A form of percussion cap mounted into the body of a center fire cartridge.

Ramrod. In old muzzle-loading arms, this was the wood or metal piece used for running the charge down the barrel.

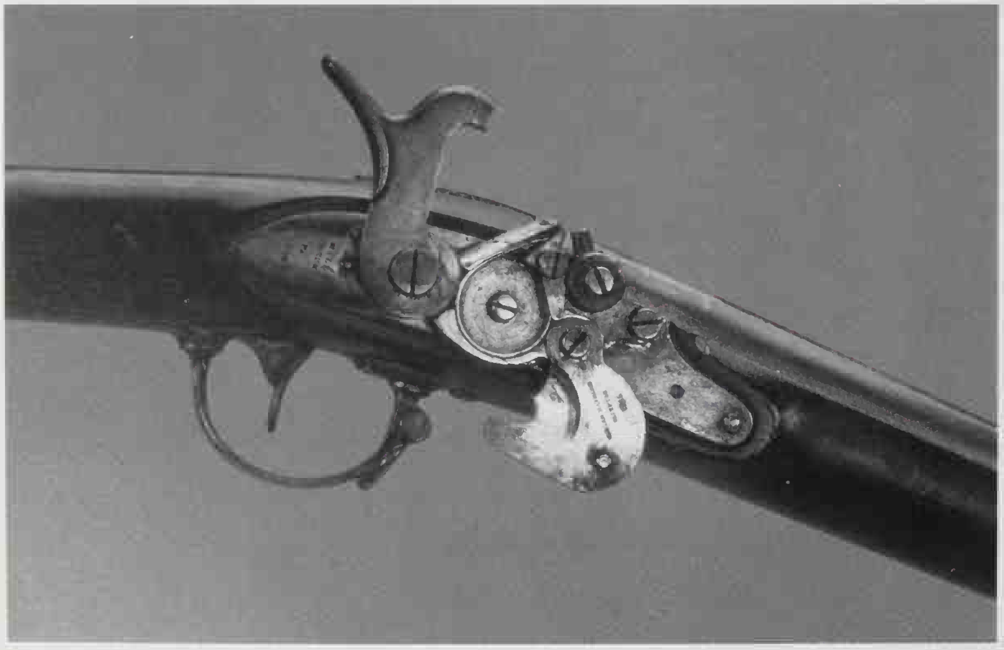


***At left:* World War II generals whose troops used American firearms: Eisenhower, Patton, Bradley and Hodges. *Above:* An account of 'the Texas campaign.' *Above right:* European troops with eighteenth-century weaponry. *At right:* Remington reloading materials.**





HEIRLOOM 1
Past Historians:
Arthur Ulrich 1903–1941
Harold Hart 1942–1945
Charles Coles 1950–1965
Ron Wagner 1957–1972



These pages, clockwise from above: A closeup of the Maynard Tape Priming system; a Colt Heirloom 1 'mirror brite' .45 caliber Officer's ACP; hand-tuning Colt revolver and ACP actions; a publicity photo of Remington 'Hyper Velocity' Yellow Jacket .22 rimfire cartridges; Colt's new Delta automatic pistol and Delta Heavy Barrel (H-Bar) AR-15; and a US soldier samples his tasty rations with his Colt M16 nearby.

Ratchet. A gear milled with teeth and mounted at the back of the cylinder of a revolver which engages the pawl that turns the cylinder.

Revolver. Short for 'revolving pistol.' Used today to describe any cylinder-revolving handgun.

Rifle. Technically, any firearm whose barrel is grooved, or 'rifled,' on the inside, thus causing the bullet to spin as it is fired. Rifles were invented in Europe in the 16th century and adapted to American use in the early-to-middle 1700s. The Kentucky Rifle is the most famous adaption of the earlier European versions.

Rifling. The particular pattern of grooving on the inside of a barrel which imparts lateral spin to the bullet, thus increasing accuracy by means of gyroscopic force.

Rimfire. A metallic cartridge whose percussion priming mechanism is in the rim, rather than the center, of the cartridge base.

Shot. *(see Bullet)*

Shotgun. A smoothbore gun, made to discharge either shot or a large, soft, hollow 'slug.'

Sight. A device, composed of two parts, used for aiming a weapon. These two parts are: a notch or more sophisticated device at the breech of the barrel and a blade, pin or ball at the muzzle of the barrel.

Single Action. A type of revolver action in which the hammer must be cocked by hand before the trigger can cause it to fall on the charge. The manual cocking of the hammer rotates

YELLOW JACKET™ 22
50 Hyper Velocity
Rim Fire Cartridges
Warning
Keep Out of
Reach of Children
Remington.
Range—1½ Miles
Be Careful

the cylinder and, therefore, the cartridge into its proper position.

Trigger. A lever which, when pulled upon by the finger, engages the firing mechanism of the firearm.

Triggerguard. Generally, a loop of metal surrounding the trigger which prevents its being accidentally struck.

Wheellock. This was the first type of ignition for a firearm that did not require a lighted match to set off the powder. The mechanism was actually a windable, spring-loaded wheel which struck sparks against a piece of flint, thus igniting the weapon's powder charge.

DELTA ELITE
COLT AUTO

INDEX

- Addis, Thomas: 338
- Alexander II, Tsar: 136
- Ammunition: Browning 16, *20-21, 37, 45*, 84; Colt 154-157; Remington 270-285, *427*; Winchester 334-349, *337, 339, 340*
- Ammunition Manufacturer's Association: 344

- Baerten, Jose: 104
- Barnes, Joanna: *200*
- Bennett, Thomas G: 332, *333*, 338, 347-348
- Bennett, TG: 17
- Berdan Slam Bang Breech: 272
- Berdan Russian Rifle. 164
- Berdan, General: 164
- Berdan, Colonel Hiram: 272, 276
- Black powder: 358, *See also Ammunition: Winchester*
- Board of Associated Charities: 329
- Bonaparte, Napoleon: 82
- Bonney, William: 159
- Boone, Daniel: 366
- 'Boxer' Center Fire cartridge: 154
- 'Boy Scout Rifle': *See Remington Model 4S*
- Bradley, General Omar: *421*
- Brewer, Henry: 340, 342, 347
- Browning Arms Company: 64, 85, 175
- Browning Bows: 97-100, *100*
- Browning, Edward: 18
- Browning, John Moses: *4*, 11, 13, 15, 16, 17, 21, 22, 24, 26, 28,33, *49*, 52, *52*, 57, 60, 64, 66, 68, 72, 76, 80, 85, 104,105, 175, 332, *333, 370*, 371, 372, 380, 384
- Browning, John Val: 22
- Browning, Jonathan: 11, 12, *12*, 13
- Browning, Matthew: 13, *17*, 18, *49*, 85
- **Browning Models**
  - Automatic Gun: 17, 18, 19
  - Automatic-5, Standard: *58-59, 83*, 94
  - Automatic Magazine Gun: 66
  - Automatic Rifle: 21, 48, 92
  - Automatic Shotgun: 56-57, 85, 116-117
  - Automatic .32 Caliber Pistol: *26-27*, 85
  - BAR Automatic Rifle: *32, 48-49, 50, 51*, 92, *108-109, 111*
  - BDA Double Action Automatic Pistol: 88
  - Bicentennial 78 Set: 92
  - Bicentennial Commemorative Superposed: 105
  - BL-22 Lever Action Repeating Rifle: *14-15, 38-39*, 92
  - BLR Lever Action Repeating Rifle: 92
  - BPR .22 Pump Rifle: 92
  - BPS Pump Shotgun: *96-97*, 97
  - Breechloading Firearm: *23, 68*
  - Browning Peacemaker: *See Colt Model 1895 Automatic Machine Gun*
  - Browning 78 Single Shot Rifle: 92
  - BSS Hammerless Double Barrel Shotgun: 96
  - BT-99 Grade I Single Barrel Trap Gun: 96
  - Challenger Automatic Pistol: 87-88
  - Citori Over and Under Hunting Shotgun: *95*, 97, *110*
  - Classic Edition: 109
  - Double Automatic: 64, 65, 96
  - Experimental Gas-Operated Firearm: 68
  - Gas-Operated Machine Gun: *19*, 66
  - Gas-Operated Breechloading Gun: 68
  - Gas-Operated Machine Gun: 19, *19*
  - Gold Classic Edition: *58-59, 103*, 109
  - Grade I Three or Five Shot Autoloading Shotgun: *90-91*, 94
  - Hi-Power 9mm Automatic Pistol: *2, 7, 34-35*, 32-33, 87
  - High-Power Bolt Action Rifle: 88
  - Jonathan Browning Mountain Rifle: 105, 108
  - Jonathan Browning Cylinder Repeating Rifle: *10-11*, 11, 12, 13,
  - Lever Action Repeating Rifle: 40
  - Liège Over and Under Shotgun: *83*, 96-97
  - Light Browning: *See Browning Light Machine Rifle Model 1917*
  - Light Machine Rifle Model 1917 (BAR): 52
  - Lightning Superposed: 109
  - Limited Edition Black Duck Issue: *98-99, 103, 111*
  - Limited Edition Superposed Pintail Duck Issue: *98-99, 103*
  - Limited Edition Waterfowl Superposed Shotgun: *62-63*, 108
  - Medalist Automatic Target Pistol: 88
  - M9: *See Browning 37mm Aircraft Cannon*
  - Model '06: *See Winchester Model 1890*
  - Model 17 Pump Action Shotgun: 57
  - Model 53: *See Winchester Model 1892*
  - Model 55 (Rifle): *See Winchester Model 1894*
  - Model 62: *See Winchester Model 1890*
  - Model 62 (Rifle): *See Winchester Model 1894*
  - Model 65 (Rifle) *See Winchester Model 1892*
  - Model 71: *See Browning Model 1886*
  - Model 90: *See Winchester Model 1890*
  - Model 95: *44, also see Winchester Model 1895 (Rifle)*
  - Model 99 Thumb Trigger Rifle: 44
  - Model 1886 Lever Action Repeating Rifle: *41*, 42, 116-117
  - Model 1897 Pump Action Repeating Shotgun: 56, 56-57, *116-117*
  - Model 1901: 72
  - Model 1902: 27-28, *28*, 29, *29*
  - Model 1911 Government Automatic Pistol: 28-29, *29, 48*
  - Model 1917 Heavy Water-Cooled Machine Gun: 68, *69*
  - Model 1917 .30 Caliber Air-Cooled Machine Gun: 71
  - Model 1935: 35
  - Nomad Automatic Pistol: 87
  - Rare Brownings: 384-387
  - Recoil Machine Gun: 22
  - Revolving Cylinder Rifle: *10-11*
  - Semiautomatic High Power Rifle: 48, *48-49*
  - Semiautomatic .38 Caliber Pistol: 24, *24*, 26, *26*
  - Semiautomatic .32 Caliber Pistol: 24, *26, 28*
  - Semiautomatic .25 Caliber Pistol Model Vest Pocket: 30-31, *30*
  - Semiautomatic Pistol in 9mm Parabellum Caliber: 31, *31*, 33, *33*
  - Slide Bar Repeating Rifle: 11, 12, 13, *13*
  - Superposed Shotgun: 60, *61, 62-63, 106-107*
  - Superposed Hunting Shotguns: 94, 96, 102, 104, *421*
  - Sweet 16 Automatic-5: 94
  - T-Bolt .22 Repeating Rifle, T-1: 88
  - Tubular Magazine Repeating Rifle: 40
  - Twelvette Double Automatic: 96
  - Two Millionth Browning Automatic-5 Shotgun: 104
  - Woodsman: *See Colt Woodsman .22 Caliber Semiautomatic Pistol*
  - .380 Caliber Automatic Pistol: 87
  - .22 Automatic Rifle: 86-87, 88
  - .22 Caliber Single Shot Rifle: 64
  - .25 Caliber Automatic Pistol: *30*, 87
  - .30 Caliber Air-Cooled: *72, 73*, 76
  - .30 Caliber Box Magazine Pump Action Rifle: 64
  - .30 Caliber Heavy Machine Gun: 72, *74-75*, 105
  - .30 Caliber Machine Gun: 22
  - .30 Caliber Repeater: 64
  - .32 Caliber Semiautomatic: *26-27*, 85
  - .38 Caliber Tubular Magazine Lever Action Rifle: 64
  - .44 Caliber Pump Action Repeating Rifle: 64
  - .45 Caliber Lever Action Single Shot Rifle: 64
  - .45 Caliber Pistol: 19, *29*
  - .50 Caliber Machine Gun: *22*, 76, 80
  - 12 Gauge Pump Action Shotgun: 64
  - 37mm Aircraft Cannon: *18*, 80, *81*
  - 2000 Gas Automatic Shotgun: 97
- Browning, Orville H: 11
- Browning, Val A: 22, 60
- Buell, William: 340
- Buntline Special: 159
- Buntline, Ned: 159
- Burns, James E: 280
- Butler, Frank: 232

- Carson, Kit: 366
- CD Leet Company: 272
- Center Fire cartridge: 159
- Chese, Anson: 122
- Chief Micanopy: *128*
- Child, Rachel Teresa: 15, *16, 52*
- Civil War: 224, 272
- Claridge, Bert: 344
- Clark, Elizabeth: 15
- Clemens, Samuel: 286
- Cody, 'Buffalo Bill': 329, 366, *366, 391*
- Coffeyville robbery: 162
- Collier's Revolver: 84
- Colt, Christopher: 122
- Colt Custom Gun Shop: 207, 210-211
- **Colt Models**
  - Automatic Machine Rifle: *See Browning Model 1917*
  - Automatic Pistol, Model 380 Government: *214*
  - Automatic Pistol, Model 1900: 175, 176
  - Automatic Pistol, Model 1911 Government: 176, *177, 179*, 193, *195*, 419
  - Automatic Pistol, Model 1940 Hammerless: *118-119, 174*
  - Baby Patterson Pistol: *163*
  - Bankers' Special: 168, *168*
  - AR-15 A2 Sporter II: 180, *180*
  - Berdan Russian Rifle: 164
  - Buntline Special: 159
  - Colt Carbines: 124
  - Colt 150th Anniversary Commemorative pistol: *119*, 172, *212*
  - Colt 150th Anniversary Engraving Sampler: 172, *212*
  - Colt 150th Anniversary Exhibition Gun: 172, 173, *173, 208*
  - Colt Berdan: *165*
  - Colt/Browning Automatic Gun: 175
  - Colt 'Burgess' rifle: *165*
  - Colt, experimental model: *123*
  - Colt Heirloom 1 'mirror brite' .45 caliber Officer's ACP: *426*
  - Colt Lightning Pump: *See Lightning Magazine Rifle*
  - Colt Number 1 Deringer: *118-119, 162*
  - Colt Revolver: 84
  - Colt Revolving Gun: *125*
  - Colt Walker Revolver: *134*, 135, *139*

Combat Commander: *194*
Delta Auto pistol: *426*
Delta Elite 10mm Auto pistol: *193*
Delta Heavy Barrel AR-15: *426*
Detective Special: 168, *196*
Diamondback revolver: *187*
Double Action Army Model: 160, *162*, 164, *165*
Double Action Self-Cocking Center Six-Shot Revolver: *See Double Action Army Model*
Double Diamond 45 Automatic: *216*
Double Diamond .357 Magnum revolver: *216*
First Model Hartford Dragoon: *138*
Frontier Model: *See Single Action Army Revolver*
Frontier Six-Shooter: See Single Action Army Revolver
Gatling Gun: 175, *179*
Gold Cup National Match: 29
Improved Army Pistol, 'Colt Dragoon': *134*, 135, 136, *138*
Lightning Model: *See Double Action Army Model*
London Colt: *143*
M14 Automatic Rifle: 180
M16 Automatic Rifle: 180, *180*, *189*, 191, *421*
M60 Light Machine Gun: *421*
Mark IV Series weapons: 176, *177*
Military Pistol: *128*
Model 95: 68
Model 1895 Automatic Machine Gun: 68, 72
Model 1900: 24, 27, *27*, 28, *28*
Model 1903 Pocket Pistol: *24*
Model of 1860 Army Revolver: *See New Model Army Pistol*
Model Pocket Pistol: 140
Monitor: 52
Muskets: 124, 164
Mustang 380: *421*
Navy Pistol, 1851: 140, 141, 150-151
New Model Army: 135, 138, 149, 167, *191*
New Model Army Metallic Cartridge Revolving Pistol: *See Single Action Army Revolver*
New Model Navy: 138, 139, 166, *167*, 168, *168*, *171*, *183*
New Model Pocket Pistol: 138, *143*, *149*, *199*
New Model Police: 138, 148
New Service Model Ace: *29*
New Service Revolver: *See New Model Navy*
Officers Model Target Revolver: *168*
Officers Model .38 Special: 168
Official Police Model: *See New Model Navy*
Old Model Army Pistol: 135, *140*, *199*
Old Model Navy Percussion Cap revolver: *118-119*
Old Model Navy Pistol: *2*, 136, 138, 139, *140*, *143*, *146*, *149*, *155*, 167, *199*
Old Model Pocket Pistol: 136, 138, *138*, *141*
Patterson Colt: 128, *128*
Patterson Colt Revolver: *139*
Patterson Revolving Carbine: *128*
Patterson Revolving Rifle: *132*
Peacekeeper: *184*, *195*
Peacemaker: *See Single Action Army Revolver*
Philippine Model Double Action Army Colt: *See Double Action Army Model*
Pocket Navy: 139
Pocket Positive: *See New Model Navy*
Police Positive: *See New Model Navy*
Promotion Model Revolver: 122, *125*
Python: *168*, 168-169, *171*, 172, *195*
Regular Dragoon Colt: *156*
Revolving Pocket Pistol, Model 1830: *135*
Rifles: 124, 164, *165*
Round-Barreled Army: *See New Model Army Pistol*
Service Model Ace Automatic Pistol: *203*
Shotguns: 124, 164, *165*
Sidehammer series: 138
Single Action Army Revolver: *156*, 158, 159, *160*, *160*, *162*, *166*, *173*, *197*, *206*, 207, 208, 211, *214*
Single Action Army Target Model: *158*
Single Action Metallic Revolver: *See Single Action Army Revolver*
Stainless Steel Gold Cup National Match: *177*
Stainless Steel King Cobra .357 Magnum revolver: *193*, *195*
Stainless Steel Officer's ACP: *194*
'Texas Arm': *See Patterson Colt*
Third Model Dragoon: 136
Whitney/Walker Colt: *See Colt Walker Revolver*
Woodsman .22 Long Rifle Automatic Pistol: 31, *31*, 184
Colt, Samuel: *4*, 122, 128-129, 132-133, 134-135, 136, 139, 140-141, 144, 146-147, 148-149, 153, 168, 223
Colt, Sarah Caldwell: 122
Colt's Patent Firearms Manufacturing Company: 18, 19, 24, 68, 80
Converse, William W: 329
Custer, General George A: 159, *160*, 250, *257*

Dalton, Emmett: 162
Dewey, Admiral: 258, *258*
Dickens, Charles: 141, *144*
Douglas, Kirk: *200*, *203*
Drake, Harry: 97
DuPont Corporation: 224, 228, 262-263, 280

E Remington and Son: *See Remington Arms Company*
Earp, Wyatt: 159
EI Du Pont de Nemours and Company: *See DuPont Corporation*
Eisenhower, Dwight General: *421*
Emmett, Sarah: 13
Enfield rifle: 351
Equitable Powder Manufacturing Company: 358

Fabrique Nationale: 17, 19, 22, 82, 84, 85
Fairchild Engine and Airplane Corporation: 180
Federal Aid in Wildlife Restoration Act: *See Pittman-Robertson Act*
Fitzgerald, JH: *184*, 185
FN-Browning Light Automatic Rifle: 64
Ford, Henry: 146
Forsyth, Alexander: 84
Funken, Felix: 104
Fusil Mitrailleur Browning: *See Browning Model 1917*
Fusil Mitrailleur Leger: 52

Gardner, John: 342-343
Gatling, Richard J: *179*
Geiger, Leonard: 250
Geiger gun (rifle and carbine): 250
Goering, Reichmarshall Herman: 22
Gould, AC: 341
Green, Colonel S Gordon: 80
Griffiths, John: 223

Hague Decrees: 351
Hanauer, P: 105
Hart, William S: *160*
Hartford State Technical Institute: 215
Hartford Factory: 134, 135, *136*, 136, 140, 147, 148, *148*, 149, 150-151, *151*, 152-153, *153*, 182-183, *183*, 184-185, 187, 188-189, 192, 194-195, 196-197, 200, 203
Hartley, Marcellus: 272, 276-277, 334
Haulier, Monsieur: 154
Henry, Benjamin: 326, *326*, 389
Henry rifle: 154, 326, *326*, *329*, *331*
Hepburn, LL: 236
Hickok, 'Wild Bill': 159, 366
Hobbs, AC: 272, 276
Hodges, Courtney General: *421*
Hooper, Arthur: 347

Jarvis, Elizabeth Hart: 136
Jenks, William: 247-248
John Griffiths Company: 247
Jonathan Browning Cylinder Repeating Rifle: *10-11*, 11, 12, 13,105
Juarez, Benito: 390

Kidder Peabody: 352
King Louis XIV: 82
Krag-Jorgensen rifle: 338

Lake City Army Ammunition Plant: 363
Lee, James Paris: 256, 258
LeMay, Curtis General: 180, *421*, 240, 241
Lesmok: 341
Liggett, Louis K: 352
Lincoln, Abraham: 11, *11*
London Colt: *143*
London Factory: *140*, 141, 144, 146

Masterson, Bat: 159
Mattheson Chemical Corporation: 363
Mauser's Rifle: 84
Maynard tape primer system: *251*
McKinley, President William: 364
Metallic cartridge: 154, 160
Metallurgy: 339-340
Milton, Jeff: *335*
Mix, Tom: *301*
Monte Carlo stocks: 227-228
Moore, Commodore: 139
Moore, Fred: 82
Morgan, James: 300, 304
Murphy, Audie: *312-313*

National Arms Company: 160
National Lead Company: 348
New Haven Arms Company: 326, *331*, 429
Nicholas II, Tsar: 260
Nixon, Richard M: 104

Oakley, Annie: *233*, *366*
Olin, Franklin W: 358, *376*,
Olin, John: 358
Olin Corporation: 422
Olin-Mattheson: 363
Otterson, John Edward: 351, 352

P-39 Bell Airacobra: 80, *80*
Patent Arms Manufacturing Company of Patterson, New Jersey, Colt's Patent: 212, 232
Patterson Factory: 122, 123, *125*, 128, 131, 132-133
Patton, George General: *189*, *421*
Pauly, Monsieur: 154
Peary, Admiral Robert: 368, 369
Perry, Commodore MC: 247
Pershing, General John: 76
Peters 'Accelerator' bullets: 282
Pittman-Robertson Act: 93
Potato Digger: *19*, *also see Winchester Model 1985*
Pratt, Francis A: 136
Pratt & Whitney Company: 136
Pump Action: 351

Reloading tools: *342-343*
Rem Choke choke tube: *238-239*
Rem Oil: *285*
Remington, Abigail: 286, 288
Remington Arms Company, Inc: 48, 60, 223-224, 227-229, 236, 251-252, 258, 284, 343, 347
Remington-Beals Revolvers: 224, *350-351*, 310, 312, *312*
Remington Custom Shop work: *306-307*
Remington, Eliphalet: 223, 241-242, 250, 286, *295*, 307

Remington, Eliphalet 'Lite' Jr: *4*, 223-224, 286-288, *288*, 290-292, 296, 300, 302, 304, 307
Remington, Eliphalet III: 223, 350
Remington-Elliot Deringer 22 RF: 313
Remington, Flora: 252
Remington, Maria: 248
Remington Models
  A-3: *See Model 1903 Springfield Rifle*
  Black Hills Rifle: 315
  'Boy Scout Rifle': *See Remington Model 4S*
  Contract models: 256-257
  Creedmoor Rifle: 236, *243*, 315
  Double Deringer: *294-295*, *312*, 313
  Enfield Rifle: *See Remington/Lee Rifle*
  Geiger gun (rifle and carbine): 250
  Hammerless Shotgun Model 1894: 321
  'Harpers Ferry Rifles': 247
  Iroquois Revolver: *267*, 313
  Jenks Breech-loading Percussion Carbine: 223
  LT-20 Limited Shotgun: *320*
  Lebel Rifles: 258, *259*
  Lee/Enfield Rifle: *See Remington/Lee Rifle*
  Long Range XR-100 Pistol: *236-237*
  M-1 Garand: *236-237*
  M-1917 Enfield Rifle: *See US Rifle Model 1917*
  Magazine Deringer Model: 225
  Marlin Model 86 Rifle: 229, 232
  Mark III Signal: *267*, 213
  Mauser Repeating Rifle: 258
  Mid-Range Target Rifle: 319
  Model 11/2 Sporting Rifle: 316
  Model 2 Sporting Rifle: 314, *315*
  Model 4S 'Military Model' Rolling Block Sporting Rifle: 226, *317*
  Model 7 Rifle: *238-239*, 310
  Model 8 Autoloading Center Fire Rifle: 48
  Model 8A Autoloading Rifle: 316, *317*
  Model 10A Standard Grade Slide Action Repeating Shotgun: 321
  Model 11A Standard Grade 5-Shot Autoloader: 321
  Model 11-87 Premier Shotgun: *238-239*
  Model 12A Slide Action Repeating Rifle: 316
  Model 14A High Power Slide Action Repeating Rifle: 316, *317*
  Model 16 Autoloading Rifle: 316
  Model 17: 60
  Model 17A Standard Grade Slide Action Repeating Shotgun: 321
  Model 24A Autoloading Rifle: 316, *317*
  Model 29A Standard Grade Slide Action Repeating Shotgun: 321
  Model 31A Standard Grade Slide Action Repeater: 321, *321*
  Model 32A Standard Grade Over-and-Under Gun: 321
  Model 33 Bolt Action Single Shot Rifle: 317, *317*
  Model 34 Bolt Action Repeating Rifle: 317, *317*
  Model 40X Heavyweight Bolt Action Target Rifle:236, 320, *320*
  Model 40-XB (Center Fire Match Rifle, Varmint and Varmint Special): *236-237*, 237, 320
  Model 40-XBBR Benchrest Rifle: *236-237*
  Model 40-XR (Custom Sporter Rifle and Rimfire Rifle): *236-237*, 310
  Model 51 Automatic: *267*, 313
  Model 74 Sportsman Autoloading Rifle: *320*
  Model 81 Woodmaster: 48
  Model 81A 'Woodmaster' Autoloading Rifle: 317
  Model '95 Double Deringer: *See Double Deringer*
  Model 121A 'Fieldmaster' Slide Action Repeating Rifle: 317
  Model 141A 'Gamemaster' Slide Action Repeating Rifle: 317, *317*
  Model 241A 'Speedmaster' Autoloading Rifle: 317
  Model 511A 'Scoremaster' Bolt Action Box Magazine Repeating Rifle: 310, 317
  Model 521 TL Junior Target Bolt Action Repeating Rifle: 317
  Model 541-S Custom Sporter: 320
  Model 541-T Bolt Action Rimfire Rifle: *229*
  Model 550A Autoloading Rifle: 317
  Model 552A 'Speedmaster' Autoloading Rifle: 317
  Model 572A 'Fieldmaster' Slide Action Repeater: 317
  Model 580 Bolt Action Single Shot: 317
  Model 600: *See Mohawk 600*
  Model 660 Bolt Action Carbine: *221*, 320
  Model 700 Rifles (ADL, BDL, Classic, Hunting, Mountain, Safari, Sporter, Varmint Special): *2-3*, *218*, 228, *228-230*, 236, 310, 320
  Model 720 Rifle: 228
  Model 721 Rifles (721 and 721A): 229, 231-232, 236, 317
  Model 722 (722 and 722A): 229, 231-232, 236, 317
  Model 742 (Woodmaster and BDL Custom Deluxe): *234-235*, 315, 317, *317*
  Model 760 (Deluxe and 'Gamemaster' Rifles): *234-235*, *315*, 317, *317*
  Model 788 Center Fire Bolt Action Rifle: *232*, 320
  Model 870 (.410 Field, New Model Express, SP Deer Gun, SP Magnum, Special Field, Wingmaster, Wingmaster AP, Wingmaster Deer Gun and Youth Gun): *218*, 237, *237*, *269*, *284-285*, 321
  Model 1100 (Autoloading Trap Gun, SA Skeet Gun and Special Field): *218*, *219*, *240*, *302-303*, *306-307*, *315*
  Model 1841 Percussion 'Mississippi' Rifle: 232
  Model 1861 Army Revolver: 312
  Model 1863 Percussion Contract: 314
  Model 1865 Navy Rolling Block Pistol: 313, *313*
  Model 1867 (Navy Cadet Rolling Block Rifle and Navy RollingBlock Pistol): 313-314
  Model 1871 (Army Single Action and Army Rolling Block Pistol): *267*, 313
  Model 1875 Single Action Army Revolver: 313
  Model 1882 Shotgun: *308-309*, 321
  Model 1885 Double Barrel Hammer Shotgun: 321
  Model 1887 Double Barrel Hammer Shotgun: 321
  Model 1889 Double Barrel Hammer Shotgun: 321
  Model 1890 Single Action Army Revolver: *312*, 313
  Model 1891 Target Rolling Block Pistol: 313
  Model 1900 Hammerless Shotgun: 321, *321*
  Model 1901 Target Rolling Block Pistol: *312*, 313
  Model 1903 Springfield Rifle: *264*, *266*
  Model 1919 Government Experimental Pistol: *267*
  Model 3200 Field Grade Over-and-Under Shotgun: 321
  Model 7600 Rifle: *236-237*, *246-247*
  Mohawk 600: *226*, *286-287*, *298-299*, *310*, 320
  Monte Carlo stocks: 227-228
  New Custom XT-100 Heavy Barrel: 314
  New Model Army Revolver: 312
  New Model Belt Revolver: 312
  New Model Number 4 Rolling Block Rifle: 316, *317*
  New Model Pocket Revolver: 313
  New Model Police Revolver: 313
  Number 1 Revolver: *267*, *312*, 313
  Number 4 Revolver: *312*
  Nylon 66 Rifles: 320
  Nylon 76 Lever Action Repeating Rifle: 320, *320*
  'Old Model Army': *See Remington Model 1861*
  'Old Army' cap and ball Revolver: *248*
  'Over-Under Deringer': *See Double Deringer*
  'Parlor Pistol': *See Remington-Rider Single Shot Deringer*
  Remington-Beals Revolvers: 224, 310, 312, *312*, *350-351*
  Remington-Elliot Deringer 22 RF: 313
  Remington-Hepburn Number 3: *215*, 215, 216
  Remington-Hepburn Number Schuetzen Match Rifle: 216
  Remington-Jenks Carbines: *246*, 247-248
  Remington-Keene Magazine Bolt Action Rifle: *254-255*, 315
  Remington-Lee Magazine, Bolt Action Rifles: 250, *257-263*, 315
  Remington-Parker Shotgun: *222-223*, *294-295*
  Remington-Rider Pistols: *267*, 312, 313
  Remington Third Model Beals Pocket Revolver: 310
  Remington-Whitmore Model 1874: 321
  Remington-UMC: *See Remington Arms Company*
  Revolving Percussion Rifle: 314
  Rifle Cane: 314, *315*
  Rolling Block Rifle: *246*, *249*, 250-252, *251*, 253,
  'Saw Handle Deringer': *See Vest Pocket Pistol*
  Single Shot Breech-Loading Carbine: 314
  'Split Breech Remington': *See Single Shot Breech-Loading Carbine*
  Sportsmans 48A Standard Grade Autoloader: 321, *321*
  Sportsman 58 ADL Autoloader: 321
  Sportsman 78 Rifle: 234-235
  Sportsman 581 Bolt Action Rifle: 224, 320
  Sportsman 581-S Rifle: *234-235*
  US Enfield Rifle: *See US Rifle Model 1917*
  US Rifle Model 1917: *260*, 261-262, *262-263*, *265*
  XP-100 Single Shot Pistol: 313
Remington, Philo: 223-224, 350, 258
Remington, Samuel: 223-224
Remington-UMC: *See Remington Arms Company*
Rexall: 352
Reynier, Adrien: 82
Rider, Joseph: 250
Roosevelt, Theodore: 364, *364*
Roosevelt, Kermit: 364, 365
Root, EK: 139, 147, 150
Rough Riders: 346

Saive, DD: 64
Savage Arms Company: 228, 250
Schiefflin, Ed: *331*
Scholes, Christopher Latham: 282
Second Seminole War of 1835: *128*
Seminole War: 129, 132
Servaty, Elizabeth: *See Topperwein, 'Plinky'*

Sherman Anti-Trust Law: 334
Shotgun shells: *274-275*
Skeet Shooting: 101, *101*
Smith, Joseph: 12
Smith & Wesson Combat Magnum: 169
Smith & Wesson Firearms Company: 136, 166, 169
Smith & Wesson Highway Patrolman: 169
Smith & Wesson .357 Magnum: 169
Smokeless powder: 358, *See also Ammunition: Winchester*
Smokeless Powder Sporting Rifle: *See Winchester Model 1894*
Soft Point bullet: *278-279*
Solid-Head cartridge: *156*
Spanish-American War: 364, 377, 397
Special Flight Bow: 97
Spencer rifle: 154
Sporting Shooting: 101, *101*
Springfield Model A-3 Rifle: 263
Springfield Model 1903 Rifle: 263
Springfield trap door models: *254-255*
Stalcup, Elizabeth: 11, 13
Starr, Nelson K: 64
Stevens, Harry: 184
Stokes, Bill: 215
Strugnell, HJ: 347

Talcott, Lt Col George: 31
Topperwein, Adolph: 369, *369*
Topperwein, 'Plinky': 369, *369*
Trant, Timothy: 185
Trap Shooting: 101, *101*
Twain, Mark: *See Samuel Clemens*

Uhl, Edward: 399
Union Metallic Cartridge Company (UMC): 224, 228, 258, 260, 263, 270, *270*, 276-277, *277*, 334, 343, 344, 347
United Drug Company: 352
US Cartridge Company (USCC): 344, 348
US Repeating Arms Company: 363

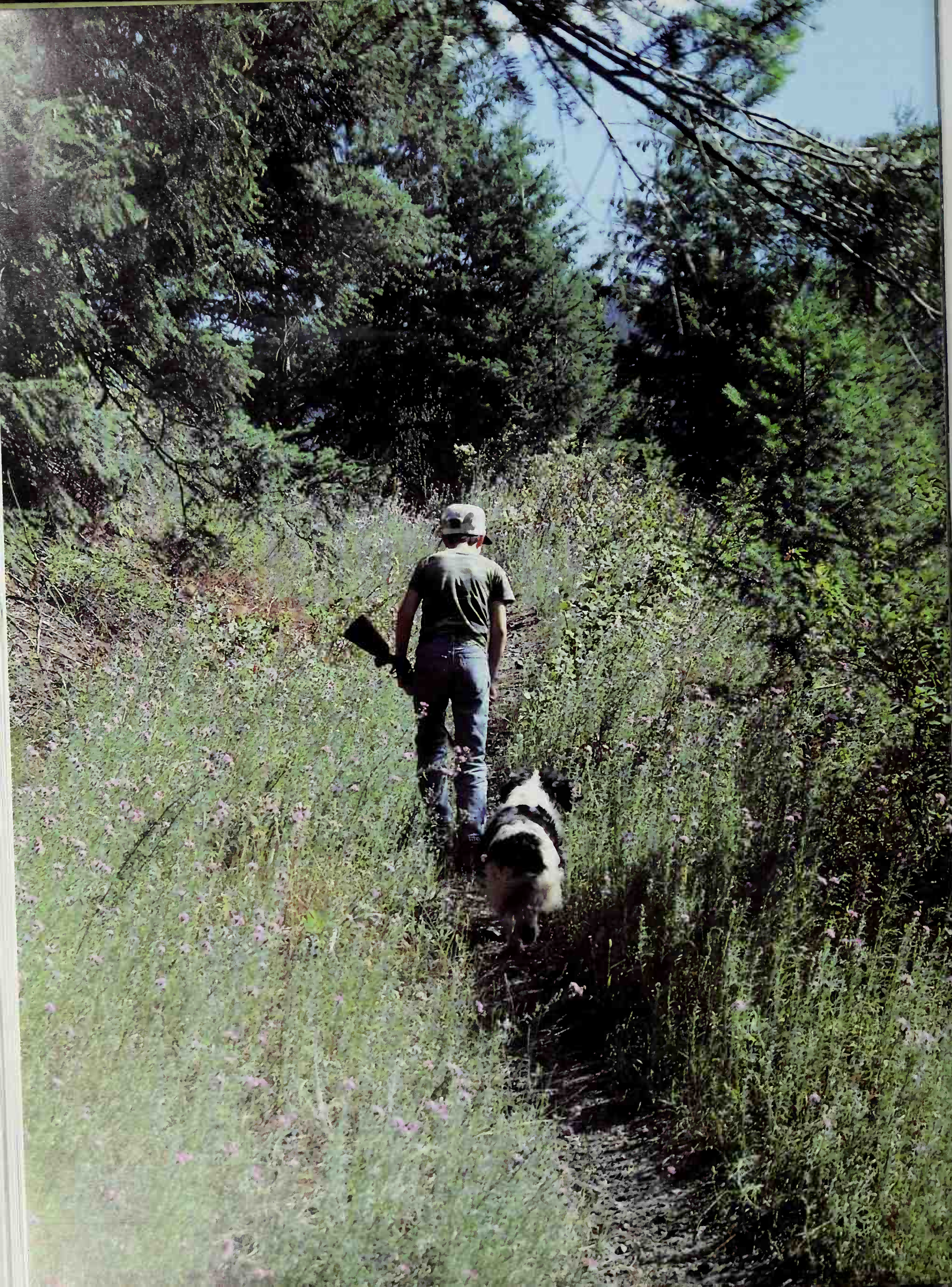
Vandermissen, G: 104
Volcanic Repeating Arms Company: 326, *326*, *329*, *428*

'Walker-Hepburn': *See Remington-Hepburn Number Schuetzen Match Rifle*
Walker, Samuel H: 132-133, 134, *134*, 135
Watrous, George R: 347
Wayne, John: 160, *200*, *203*
Western Cartridge Company: 356, 358
White, Ed: 148, *148*, 158, *158*
White, Rollin: 136, 154
Whitney, Amos: 136
Whitney, Eli: 134
Whitneyville Armory: 134, *136*
Wild, Joseph: 340
Winchester Center Fire (WCF): 338
Winchester Custom Shop: 329
Winchester laboratory: 338-340
Winchester Models
Browning Automatic Rifle: 351, *379*, *380*
Experimental Rifle: *389*
Leader: 338
Lee Model Winchester: 395, 397
'New Model Winchester': *See Model 1866*
Ranger Lever Action Carbine: *414*
Ranger Bolt Action Carbine: *412*, *413*
Sharps .40-90: 334, 364
Single Shot, 'Baby Carbine': 371, 372
Single Shot Rifle: *370-371*, 371, 372, *372*, 413
Model 1 Super X Automatic Field Gun: 411
Model 03: 351, *352*
Model 06: 373, *374*, *See also Model 62*
Model 20: 403, *403*
Model 21: 456, *456*, 403, *403*, 406, *406*
Model 23: *358*
Model 24: 406, *406*
Model 25: *410*, 411
Model 36: 44, 379, 403, *403*
Model 37: 406, *406*
Model 40: 406, *406*
Model 41: 403, *403*
Model 42: 406, *406*
Model 50: 411
Model 52: 356
Model 53: 373, *373*, 395, 399
Model 54: 356, *356*, *See also Model 70*
Model 55: *376*
Model 58: 378, 379, *379*
Model 59: 378, 379, *379*, 411
Model 60: 378, 379, *379*
Model 62: 373
Model 64: 376, *376*, 377, 395
Model 65: 373, *373*, 395, 399
Model 68: 378, 379
Model 70: 228-229, 231-232, 356, *361*, *401*, *410*, 412, *412*, *413*, *415*
Model 71: 373, *373*
Model 73 Lever Action: 66, 258
Model 86: 15
Model 90: *See Model 62*
Model 92: 351
Model 94: 229, 232, *322-323*, *347*, 351, *354-355*, *361*, *378*, 414-415, *414*, *415*
Model 94 Chief Crazy Horse Commemorative: 415, *415*
Model 96: 411
Model 97: 333, *350*, 351, *403*
Model 99: 378, *378*, 379
Model 101: *410*, 411
Model 370: 406
Model 1200: 411
Model 1300: *408*
Model 1400: 411
Model 1866: *322-323*, 326, 329, *331*, 333, 389, *389*, 390, *391*
Model 1871: 373, *373*, 395
Model 1873: *322-323*, 329, 333, 340, 346, *388*, 390, *390*, 391, *391*, 392, *392*, 395, *395*
Model 1876: 333, 364, *365*, 392, *392*, 395, *395*
Model 1878 Single Shot Rifle: 15, 16
Model 1885 Single Shot Rifle: *16-17*, 36, 40, 332, 338, 371, *372*, 372
Model 1886 Lever Action Rifle: *322-323*, 332, *339*, 340, 365, *370*, 372, *372*, 373, *374*, 385, 397, *397*
Model 1887: 54, *350*, 382, *383*, 402
Model 1890: 42-43, *42-43*, 351, *352*, 373, *373*, 399
Model 1892: 43, 340, 351, 368, 373, *373*, 395, 399
Model 1893: 54, 56, *60-61*, *335*, 382, *382*
Model 1894: *2-3*, 15, 16, 43, 44, 351, *354-355*, 373, 376, *376*, 385, 395
Model 1895: 44, 364, 365, 377
Model 1897: 56, *56-57*, 333, *350*, 351, 382, *382*, 384, 402
Model 1898: 351, 397
Model 1900: *38-39*, 44, *44*, 378, 379, *379*
Model 1901: 54, 382, *383*, 395, 402, *402*
Model 1902: *378*, 379
Model 1904: *378*, 379
Model 1911: 402, *402*, *403*
Model 1912: 351, *361*, *402*, 403, *403*
Model 9422: *323*, *362*, 416-417
Model 9422 Annie Oakley Commemorative: 416, *416*
Model 9422 Boy Scout Commemorative: *348*
.22 Caliber Pull Apart Repeating Rifle: 385, *385*
.22 Caliber Rimfire Single Shot Rifle: 386, *386*
.236 Caliber Repeating Rifle: 386, *386*
.30 Caliber Bolt-sear Lever Action Repeating Rifle: 386, 386, 387
.30 Caliber Government Repeating Rifle: 384, *384*
.30 Caliber Lever Action Repeating Rifle (Number One): 385, *385*
.30 Caliber Lever Action Repeating Rifle (Number Two): 385, *385*
.30 Caliber Pul Apart Repeating Rifle: 385, *385*
.30 Caliber Pump Action repeating Rifle: 386, *386*
.30 Caliber Repeating Rifle: *385*, *386*
.30 Caliber Swing Guard Repeating Rifle: 386, *386*
.38 Caliber Repeating Rifle: 384, *384*
.40 Caliber Repeating Rifle: 386, *386*
.44 Caliber Lever Action Repeating Rifle: 385, *385*
.44 Caliber Lever Action Repeating Rifle (Number Three): 386, *386*
.44 Caliber Pump Action Repeating Rifle: 384, *384*
.44 Caliber Repeating Rifle: *385*, *386*
.45 Caliber Lever Action Repeating Rifle: 384, *384*, 385, *385*
.45 Caliber Repeating Rifle: *384*, *385*
.45 Caliber Rifle: *384*
.45-70 Caliber Repeating Rifle: 385, *385*
10 Gauge Lever Action Shotgun: 387, *387*
10 Gauge Pump Action Shotgun: 387, *387*
12 Gauge Lever Action Shotgun: 387, *387*
12 Gauge Pull Apart Shotgun: 387, *387*
12 Gauge Pump Action Shotgun: 387, *387*
20 Gauge Single Shot Lever Action Shotgun: 403, *403*
Winchester .30-30: *See Model 1894*
Winchester Repeating Rifle: 159
Winchester Pistols: 418-419
Winchester Sporting Arms: 363
Winder Musket: 372
Winchester Museum: 384
Winchester, Oliver: *5*, 326, 329, *376*, 389, 415, 419
Winchester Operations: 363
Winchester Repeating Arms Company: 15, 16, 17, 22, 36, 54, 228, 258, 272, 352, 326, 329, 341, 343, *343*, 344, 345, 347, 352, *352*, *362*, 364, 371, 374, 382, 400
Winchester Special Features: 400-401
Winchester Sporting Arms: 363
Winchester-Western Company: 358
Winder, Colonel CB: 372
World's Fair: 369
World War I: 228, 258, 261-262
World War II: 227-228, 236, 258, 263, 266, 310

Young, Brigham: 12, 13
Yule, Steve: *303*, *310*
Yule, Tom: *303-305*

'Zouave Rifle': *See Remington Model 1863 Percussion Contract Rifle*

***Overleaf:* A boy and his dog head off into the wilds, with a rifle along for protection against snakes—and to do a little 'plinking' along the way. It's an American image that dates back to the beginnings of the nation itself.**



(continued from front flap)

In 1816, young **Eliphalet Remington** decided that, despite his tender age of 24 years, he could build a better rifle than he could buy. He was right. Within a few years his fine rifle was the talk of the young United States. Hunters, settlers, soldiers—all beat a path to his door. By 1864, the Remington company held the patent for the world's first successful breech-loading mechanism. And it didn't stop there.

The pearl-handled Double Derringer favored by gamblers, the Remington .22 rifle carried by Annie Oakley, the percussion rifles that helped settle America, Civil War muzzle-loaders and the 1905 Model 11, the first successful autoloading gun—all of these are part of not only the history of Remington but the history of America.

K.D. Kirkland is a lifelong gun enthusiast with special interest in craftsmanship and classic, lasting design. Mr. Kirkland's interests besides firearms are many and varied. He has long been involved in landscape photography and all aspects of motion pictures, including script writing and film editing. He is currently based in Logan, Utah, where he is an audio-visual engineer. His writings on America's premier gunmakers are authoritative and widely read.

Front cover, top to bottom: The Winchester Model 73; the Remington Model 7600 pump action rifle; the Browning BL-22 Lever Action Repeating Rifle; and the Colt .36 caliber Navy revolver.
(Photos courtesy of the Buffalo Bill Historical Center; EI du Pont de Nemours & Co, Inc via Rumrill-Hoyt; Browning NA; and John Batchelor, respectively.)

Back cover: The automatic shotgun—one of John M Browning's revolutionary designs—has remained popular to this day. The Browning Automatic-5 is offered in many different specifications, ranging from a plain barrel to an elaborately engraved one.
(Photo courtesy of Browning NA.)

MALLARD
PRESS
An Imprint of
BDD Promotional Book Company, Inc.
666 Fifth Avenue
New York, N.Y. 10103
Printed in Hong Kong

SPECIAL STEEL 12 GAUGE
Peters
HIGH VELOCITY
SAVE this Booklet...
on the Operation and Care of
GENUINE BROWNING
...nder and Automatic Sh...
BROWNING
ARMS COMPANY
Reg. U.S. Pat. Off.
ST. LOUIS, MISSOURI

90000
9 780792 452768
N 0-792-45276-3>>000